Australian Government
Australian Institute of Health and Welfare

Better information and statistics for better health and wellbeing

National outcome measures for early childhood development

Development of an indicator-based reporting framework

June 2011

Australian Institute of Health and Welfare
Canberra
Cat. no. PHE 134

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is *better information and statistics for better health and wellbeing*.

A complete list of the Institute's publications is available from the Institute's website <www.aihw.gov.au>.

ISBN 978-1-74249-114-1

Suggested citation

Australian Institute of Health and Welfare 2011. National outcome measures for early childhood development: development of an indicator-based reporting framework. Cat. no. PHE 134. Canberra: AIHW.

Any enquiries about or comments on this publication should be directed to:
Communications, Media and Marketing Unit
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601
Phone: (02) 6244 1032
Email: info@aihw.gov.au

Published by the Australian Institute of Health and Welfare
Printed by Union Offset Printers

Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.

Contents

Acknowledgments

The primary authors of this report were Melinda Petrie, Deanna Eldridge and Michelle Quee of the Children, Youth and Families Unit. Sushma Mathur is especially thanked for providing extensive guidance and assistance. Contributions made by Annette Milnes, Suzanne Dixon, Jennifer Norton, Fiona Elliot, Deanna Pagnini, and Fadwa Al-Yaman are gratefully acknowledged.

A large number of stakeholders provided valuable advice and input on the development of this report. Members of the following working groups and committees are acknowledged for their contributions: the National Child Information Advisory Group; the Early Childhood Data Sub Group; the Early Childhood Development Outcomes Steering Group; the Child Health and Wellbeing Subcommittee; and the Headline Indicator Data Development Expert Working Group. In addition, colleagues in the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, Department of Health and Ageing and Department of Education, Employment and Workplace Relations are gratefully acknowledged for their valuable comments.

The AIHW would like to acknowledge funding provided by the Australian Government Department of Education, Employment and Workplace Relations for this project.

Summary

The Council of Australian Governments released the National Early Childhood Development Strategy, Investing in the Early Years in July 2009 (COAG 2009). One of the key reform priorities in the strategy is to build better information and a solid evidence base, and establishing national outcome measures for early childhood development has been identified as one of the key projects to progress this. Developing an indicator-based reporting framework for early childhood development will enable monitoring of achievements against the Early Childhood Development (ECD) Outcomes Framework to inform the Council of Australian Governments of progress towards the vision that 'by 2020 all children have the best start in life to create a better future for themselves and for the nation'.

This information paper outlines the process of developing an indicator-based reporting framework for early childhood development, and establishes a recommended high-level set of indicators to measure progress against the outcomes framework in the strategy.

Process undertaken

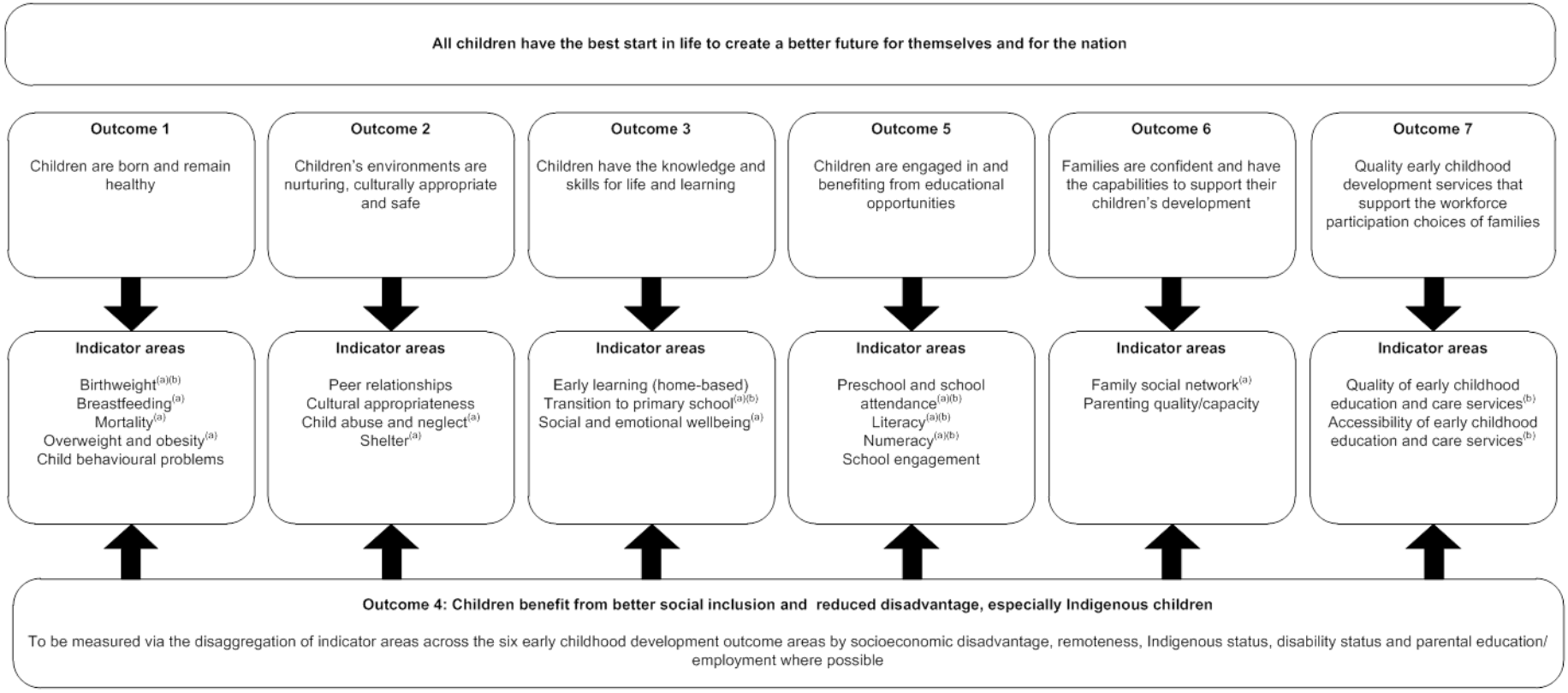
The development of an indicator-based reporting framework for early childhood development involved:

- reviewing existing national and international frameworks, and identifying key indicator areas through an extensive indicator mapping process
- reviewing national and international literature on early childhood development and outcomes
- developing conceptual models to count the relationships between all indicator areas within and across the outcomes in the outcomes framework
- consulting with key experts and stakeholders.

Indicator areas for early childhood development

The process outlined above identified 46 key areas that were considered most relevant to early childhood development and wellbeing outcomes. However the consultation process determined that fewer high-level indicators to measure progress for each of the outcomes in the ECD Outcomes Framework were needed. As a result, 20 potential indicators are recommended for reporting against the ECD Outcomes Framework in the ECD Strategy (Figure 1).

Data are currently available or will be available for reporting (by 2014) on 13 of these indicators, with data collection methodology and sources to be agreed for a further two indicators—social and emotional wellbeing and family social network. Indicators for the remaining 5 areas are not yet developed or defined—child behavioural problems, peer relationships, cultural appropriateness, school engagement and parenting quality/capacity—and require further work to conceptualise and establish the most important aspects for children's health, development and wellbeing.



(a) Children's Headline Indicator priority area.

(b) COAG participation and productivity agenda indicative progress measures.

Figure 1: Recommended high-level indicator areas for the Early Childhood Development Reporting Framework of the National Early Childhood Development Strategy

1 Introduction

1.1 National Early Childhood Development Strategy background

In July 2009, the Council of Australian Governments (COAG) released the National Early Childhood Development Strategy, Investing in the Early Years (COAG 2009). This strategy will guide Australia's comprehensive response to evidence about the importance of early childhood development, and the benefits—and cost-effectiveness—of ensuring all children experience a positive early childhood, from before birth through the first 8 years of life (COAG 2009).

The strategy is based on evidence from Australia and overseas indicating that the early years of a child's life, beginning in the antenatal period, lays the foundation for future health, development, learning and wellbeing. The early years are important in setting the foundation of adult linguistic and social competence, coping skills, cognitive development, and physical and mental health and wellbeing. A safe and nurturing family environment is particularly important for healthy child development during this time.

There is also evidence that programs and interventions aimed at alleviating disadvantage during the early years of life are effective in improving child outcomes, and often yield higher returns on investment than remedial interventions later in life (COAG 2009).

Early childhood is a period when many children face their first major transition in life from the family home to other environments, such as child care, early education and full-time schooling. This is a crucial time for learning, social and emotional development, social participation, and the acquisition of literacy and numeracy skills. It is also an important time for establishing good health. Behaviours and the physical and social environments of children during this time can increase the risk of injuries, mental health and behavioural problems, and increase the development of risk factors and long-term health conditions that persist throughout life (AIHW 2009c).

The priority: building the evidence base

One of the key reform priorities in the strategy is to build better information and a solid evidence base (COAG 2009). This aims to develop national capacity and commitment for monitoring, research and evaluation related to children, families and early childhood development services, inform policy and practice, and measure and monitor outcomes.

To address this reform priority, the strategy proposes that further consideration be given to:

- developing consistent unit record information and a comprehensive national minimum data set to support the early childhood development strategy
- improving the dissemination of the evidence about early childhood development
- improving reporting (building on existing data development and reporting initiatives), which is being considered primarily through the development of a reporting framework on the ECD Outcomes Framework
- implementing a national research agenda
- building the evidence base around innovative and integrated service delivery.

The strategy states that a key next step to progress its implementation is to:

Agree progress measures and reporting under the strategy, seeking alignment with existing data development initiatives and relevant COAG, Ministerial Council and national reporting processes, such as the Headline Indicators for Children's Health, Development and Wellbeing (COAG 2009).

Early Childhood Development Outcomes Framework

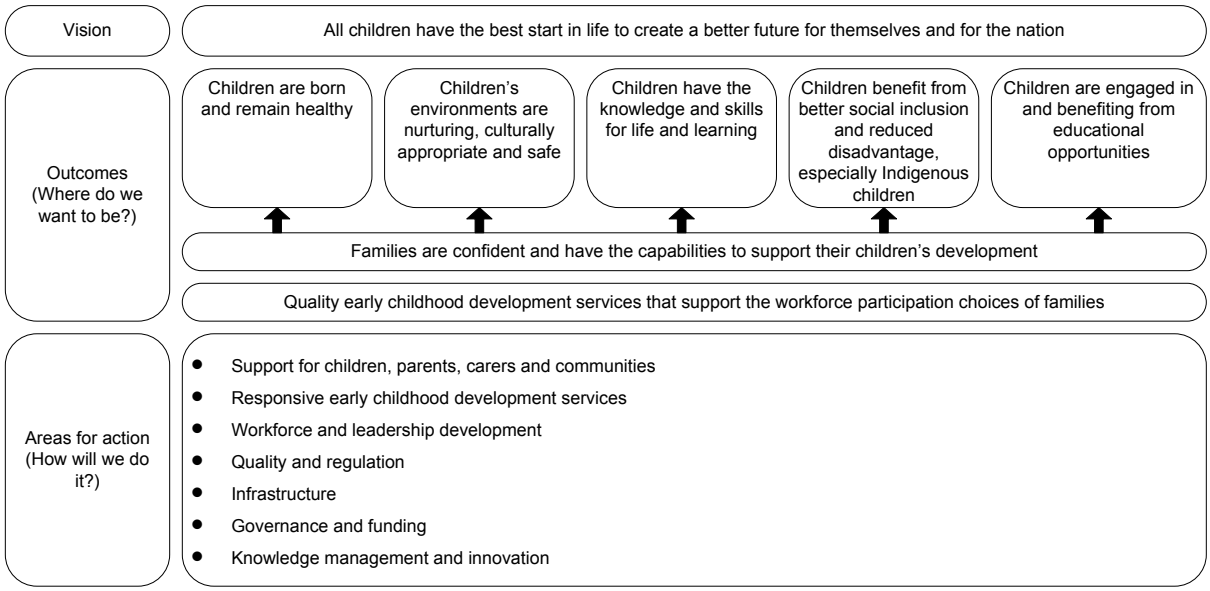
The ECD Outcomes Framework in the strategy reflects the early childhood reform priorities agreed by COAG in early 2008. It focuses on what Australia needs to achieve to fulfil the vision that 'by 2020 all children have the best start in life to create a better future for themselves and for the nation' (Figure 1.1). Several policy objectives relate to this vision, including: greater social inclusion; improved outcomes for the majority of children, but specifically Aboriginal and Torres Strait Islander children and the most disadvantaged; and increased productivity and international competitiveness (COAG 2009).

Seven outcomes were determined in the strategy. Of these, five focus on the child and broadly describes a young child's developmental pathway, beginning in the antenatal period:

- children are born and remain healthy
- children's environments are nurturing, culturally appropriate and safe
- children have the knowledge and skills for life and learning
- children benefit from better social inclusion and reduced disadvantage, especially Indigenous children
- children are engaged in and benefiting from educational opportunities.

The other two outcomes recognise the importance of the family and seek outcomes for families related to parenting relationships and workforce participation:

- families are confident and have the capabilities to support their children's development
- quality early childhood development services that support the workforce participation choices of families.



Source: COAG 2009.

Figure 1.1: Early Childhood Development Outcomes Framework in the National Early Childhood Development Strategy

The ECD Outcomes Framework is consistent with a theoretical framework grounded in an ecological model of development. This has the child at the centre of the framework, but family and wider social, community and economic influences are also taken into account (see Section 2.1 and Appendix 1 for further details on the ecological model).

The ECD Strategy focuses on the needs of young children and their families, and highlights the importance of the contextual or environmental factors in the early years, such as the role of communities, non-government organisations and government in shaping children's early childhood development. The strategy states that:

> Parents and/or other main carers have the primary responsibility for, and influence on, their child's wellbeing, learning and development. All parents need some level of support and use services at some stage during their child's early childhood years.
>
> There is, however, a broader responsibility for creating conditions in which families and children can thrive. This responsibility extends to all levels of government, communities, non-government organisations and business.
>
> Such responsibility encompasses community planning around the needs of children and families, such as for public transport, housing, parks and access to a range of supports and services. It also encompasses the broader socio-economic influences on children and families, such as the mass media, family-friendly workplaces, and broader policies for taxation and income support (COAG 2009).

1.2 The project: national outcome measures for early childhood development

The early childhood development national outcome measures project is being done under the work plan of the National Information Agreement on Early Childhood Education and Care and is being funded through research, evaluation and data development under the National Partnership Agreement on Early Childhood Education.

The primary purpose of the project is to develop an indicator-based reporting framework (see Section 1.1).

The development of the indicator-based reporting framework involved:

- reviewing existing national and international frameworks and reporting on early childhood development to establish key domains (Chapter 2)
- determining, through an extensive indicator mapping process, areas in which indicators relevant to early childhood development have been developed (Chapter 2)
- reviewing national and international literature to identify those aspects most strongly associated with early childhood development and wellbeing outcomes (Chapter 3)
- developing conceptual models to assess the extent of the relationships between indicator areas within and across the outcomes in the outcomes framework (Chapter 4)
- consulting with key experts and stakeholders via early childhood development consultation scoping and workshop discussion papers.

This process led to the identification of indicator areas most relevant to early childhood development and wellbeing outcomes, and, together with stakeholder consultation, guided the selection of indicators and data sources (Chapter 4) to measure progress against the ECD Outcomes Framework.

This work will also inform the development of a national early childhood development information strategy by helping to identify existing data gaps; a work program for data development; opportunities for data linkage; and a research agenda in early childhood development and early childhood education and care.

The relationship of these tasks to the work required to address the reporting requirements and to the need for a solid evidence base in the ECD Strategy is represented in Figure 1.2. The main tasks done by the AIHW for the national outcomes measures project are italicised.

The purpose of this information paper is to outline the process of developing an indicator-based reporting framework for early childhood development, and to establish a recommended high-level set of indicators to measure progress against the ECD Outcomes Framework in the ECD Strategy.

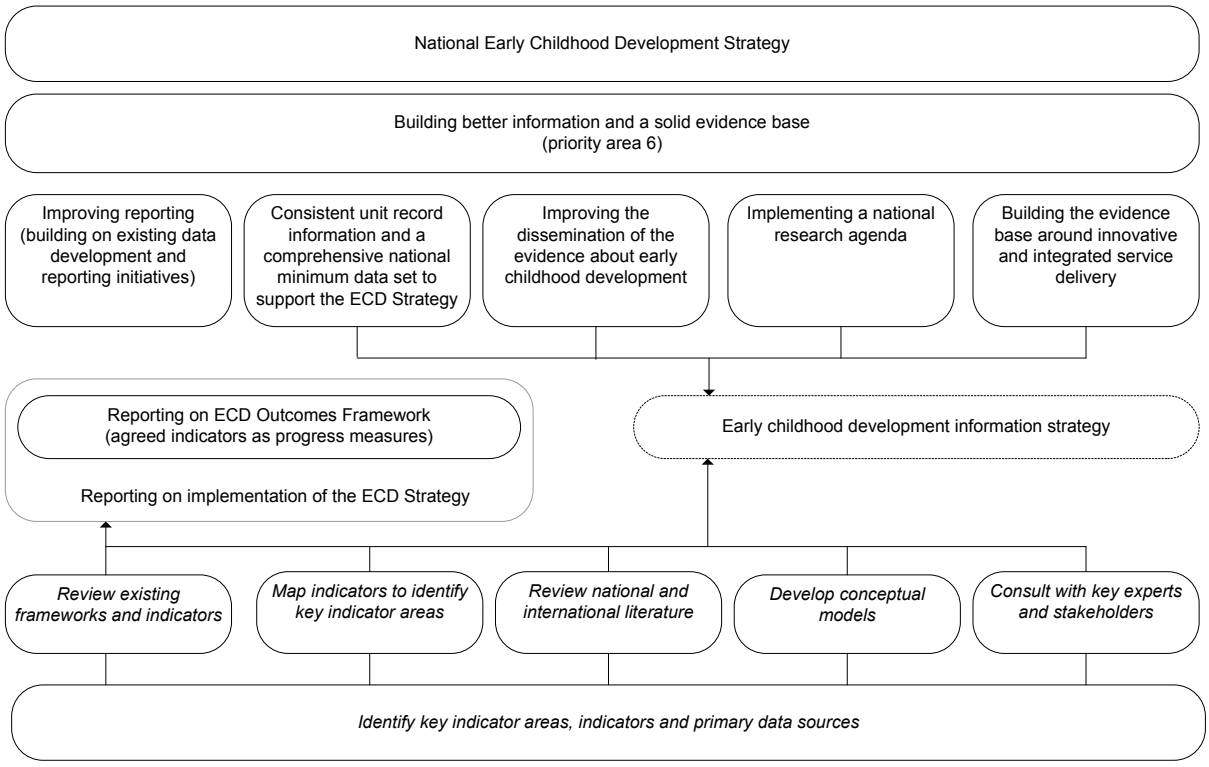


Figure 1.2: Better information and improving reporting for the National Early Childhood Development Strategy

1.3 Other related activities

There are a multitude of relevant national frameworks, concept maps and governance arrangements within the broad umbrella of early childhood development, each with its own research, reporting and information requirements.

Other relevant activities related to this project include:

- Headline Indicators for children's health, development and wellbeing (see Appendix 4)
- National Framework for Protecting Australia's Children 2009–2020
- National Quality Agenda for Early Childhood Education and Care
- National Breastfeeding Strategy 2010–2015
- social inclusion agenda
- National Family Support Program
- paid parental leave arrangements
- National Plan to Reduce Violence against Women and Children
- universal access to early childhood education under the National Partnership Agreement on Early Childhood Education
- Early Intervention and Prevention Framework under the National Disability Agreement
- Child and Family Centres under the National Partnership Agreement on Indigenous Early Childhood.

It is important that a strategic and coordinated approach is taken to ensure that information is reported consistently, the burden on jurisdictions and providers is minimised and quality data are available to produce the evidence to support national policy and future directions.

2 Review of existing reporting on early childhood development

There are a multitude of national and international frameworks, reports, national agreements, reporting tools and instruments (hereafter referred to as 'frameworks') that have been developed for children and young people. The majority of these frameworks contain elements with relevance to early childhood, and a few focus on the early childhood period. It is important to consider how these may relate to the ECD Outcomes Framework, and the implications for reporting on early childhood development outcomes under this framework.

A review of existing frameworks relevant to early childhood development was done, and involved:

- finding and reviewing relevant Australian and international frameworks (Section 2.1)
- identifying domains for early childhood development (Section 2.2)
- mapping these domains to the outcomes framework (Section 2.3).

This chapter provides the results of the framework review and the domains that emerged as important.

2.1 Reviewing child and youth reporting frameworks

Existing national and international reporting on early childhood development was reviewed to map the current reporting environment, and assess how this work could be built on for a framework to report on progress towards implementing the ECD Strategy. Sixty-one frameworks were found to be related to, or having elements related to, early childhood development. They were Australian (33), international (12), multinational (7), and discipline frameworks (9) in the areas of developmental and positive psychology, sociology and social context, education and school related (see Appendix 2 for further details on these frameworks).

The purpose and the scope of the frameworks reviewed varied, with about half (30) mainly developed to report and monitor using a set of indicators; one-third (18) to assess and monitor performance, usually against policy targets and objectives; some (6) to assess particular aspects of development among children and young people; and the remaining 7, while not frameworks, were a mixture of projects and studies on various aspects of children's development and wellbeing. The frameworks with a main purpose of reporting and monitoring tended to be more comprehensive and broader in scope, and had a broader purpose than, for example, performance or policy frameworks. An important component of a reporting framework for early childhood development is that it includes all aspects of children's development; that is, it needs to take a holistic approach.

Of the 61 frameworks, 32 were not considered further for the purposes of identifying key domains of a reporting framework for early childhood development, because they were:

- not frameworks but reports/research relevant to early childhood development
- based on other frameworks already included in the review
- limited in scope to single aspects of health, development and/or wellbeing (for example, many of the performance/policy frameworks).

The remaining 29 frameworks reviewed provided a comprehensive picture of children's health, development and wellbeing. These included indicator-based reporting and assessment frameworks. Eight of these were Australian, 10 international, 4 multinational and 7 discipline frameworks (see Table 2.1 and Appendix 2 for further details).

2.2 Establishing framework domains

The 29 frameworks were examined to identify the domains that were most relevant to a reporting framework for early childhood development. While there was significant variation in the organisational framework (that is, structuring of the information), there was a large degree of commonality in the domains covered. In most cases, the domains could be categorised as factors relating to the individual, such as mortality or birthweight, or factors relating to the context (or environment) that influence the child indirectly, such as family, peers, the settings that he or she interacts with (such as early childhood education and care, schools), neighbourhood, the wider community and society at large. Individual factors are essential to understand how well children are developing, and contextual factors can provide an understanding of what leads to positive outcomes.

The domains that emerged from the 29 frameworks reviewed can be summarised as:

- individual factors
  - physical
  - psychological
  - cognitive/learning
  - social and emotional development/wellbeing
  - behavioural
- contextual factors
  - family and/or pears
  - environment
  - community
  - socioeconomic background
  - systems/services.

Table 2.1 maps these domains to the 29 frameworks reviewed. The most comprehensive frameworks contained indicators in the majority of domains across both individual and contextual factors. Both individual and contextual factors are crucial to present a holistic view of child development, and are important to include in a reporting framework for early childhood development. Understanding interactions between child outcomes (individual factors) and the context in which children live is critical in understanding opportunities to prevent, reduce or increase the outcome of interest (Zubrick et al. 2000).

While many of the frameworks outlined in Table 2.1 provide a reasonable coverage across the majority of domains, and take a holistic approach to early childhood development outcomes, only those shaded grey are based on an ecological approach. In an ecological approach the child is at the centre of the framework, surrounded by their family, the community that supports families, and the societal factors that enable communities and families to support children (see Appendix 1 for further details on the ecological approach). Frameworks based on an ecological approach tended to be the most comprehensive across the identified domains, as these frameworks take into account the influences of family, and the wider social, community and economic contexts in which children grow up.

As discussed in Chapter 1 the ECD Outcomes Framework has also been developed around an ecological model of development. The child-focused outcomes in the outcomes framework place the child at the centre of the framework, with each specific outcome reflecting multiple levels of environmental influence, such as family, the school, peer, neighbourhood, community and social services.

Table 2.1: Comparison of frameworks across key domains

	Individual factors					Contextual factors				
Framework	**Physical**	**Psychological**	**Cognitive/ learning**	**Social and emotional wellbeing/ development**	**Behavioural**	**Family/ peers**	**Environment**	**Community**	**Socio-economic**	**Systems and supports**
Key national indicators of children's health, development and wellbeing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Headline indicators for children's health, development and wellbeing	✓		✓	✓		✓	✓	✓	✓	
Australian Research Alliance for Children and Youth report card: the wellbeing of young Australians	✓		✓		✓	✓	✓		✓	
Victorian Child and Adolescent Outcomes Framework	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indicators for child health and development and wellbeing[(e)]			✓	✓	✓	✓	✓	✓	✓	✓
Australian Early Development Index	✓		✓	✓						
Longitudinal Study of Australian Children framework	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Health Performance Framework	✓	✓	✓	✓	✓		✓	✓	✓	✓
America's children: key national indicators of wellbeing 2009	✓	✓	✓	✓	✓	(a)	✓	(a)	✓	
Child Trends DataBank (USA)	✓	✓	✓		✓	✓	✓	✓	✓	
Children and young people: indicators of wellbeing in New Zealand	✓		✓		✓	✓	✓		✓	
Progress of Canadian children and youth 2006	✓		✓		✓	✓	✓	✓	✓	
The wellbeing of Canada's young children	✓	✓	✓	✓		✓	✓	✓	✓	
State of the nation's children (Ireland)	✓		✓		✓	✓				✓
System of key indicators of infancy and adolescence (Spain/Catalonia)[(b)]	✓		✓						✓	✓

(continued)

Table 2.1 (continued): Comparison of frameworks across key domains

	Individual factors					Contextual factors				
	Physical	**Psychological**	**Cognitive/ learning**	**Social and emotional wellbeing/ development**	**Behavioural**	**Family/ peers**	**Environment**	**Community**	**Socio-economic**	**Systems and supports**
Statistics on children in South Africa	✓						✓		✓	✓
Child wellbeing indicators (Italy)[c]	✓		✓	✓		✓			✓	✓
Every Child Matters Outcomes Framework (UK)	✓	✓	✓	✓	(d)		✓	✓	✓	✓
Multi-national project for monitoring and measuring children's well-being	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Organisation for Economic Co-operation and Development: Doing better for children	✓		✓		(d)		✓	✓	✓	
UNICEF: Child poverty in perspective: an overview of child well-being in rich countries	✓		✓	✓	✓	✓		✓	✓	
Child Health Indicators of Life and Development	✓	(a)	(a)	(a)	(d)		✓		✓	✓
Early childhood development in social context	✓	✓	✓	✓		✓	✓	✓	✓	✓
Indicators of child, family and community connections[e]						✓		✓	✓	
Indicators of social and family functioning						✓	✓	✓	✓	
Positive indicators of child wellbeing	✓		✓	✓	✓	✓	✓	✓	✓	✓
America's Promise Alliance					✓	✓		✓		
Developmental assets for early childhood and children			✓	✓		✓	✓	✓		
Elementary school success profile dimensions	✓		✓	✓		✓		✓		

(a) Recognised as an important area for further indicator development.
(b) Many of the indicators in this framework could not be classified into these domains.
(c) This framework and indicators are under development. The classification for this framework is therefore indicative only.
(d) Largely relevant to adolescent children, rather than early childhood.
(e) While based on an ecological approach, do not further develop conceptual models or specify a reporting framework, and have not been used for reporting as an indicator set to date.
Note: Grey shading indicates frameworks based on the ecology of human development (Bronfenbrenner 1979). See Appendix 1 for further details.

2.3 Mapping the ECD Outcomes Framework to the key domains

The domains identified through the framework review map well to the ECD Outcomes Framework, and this relationship is discussed below for the seven outcomes.

Outcome 1: Children are born and remain healthy

Early childhood is a period of rapid development during which time it is critical to establish good health, positive health behaviours and overall wellbeing. During this time it is important to reduce the factors that adversely affect the health of children, and to promote factors that improve health. Information on patterns and trends in child health status measures and risk, as well as protective factors, is essential to assess the health of Australian children, and is key to preventing disease, illness and injury. Critical aspects in reporting against this outcome include **individual** factors relating to:

- health status and presence or absence of disease (*physical* domain); for example, antenatal care, mortality, and chronic and preventable conditions
- mental health problems and disorders (*psychological* domain)
- protective factors, which promote positive health (*behavioural* domain); for example immunisation, good nutrition, physical activity, breastfeeding, and good dental health
- risk factors that adversely influences health (*behavioural* domain); for example low birthweight, substance use during pregnancy, overweight and obesity, and high use of electronic media.

Outcome 2: Children's environments are nurturing, culturally appropriate and safe

The family and community environment plays a vital role in protecting children from physical and emotional harm, which can adversely affect the health and wellbeing of children in both the short and long term. Families play a central role in providing children with physical, emotional and economic support, and children who are raised in stimulating and nurturing environments have been shown to have better outcomes. Communities also play a role in shaping children's health and wellbeing, with strongly connected communities associated with positive outcomes for children. These environments also set the foundations for children's learning, behaviour and health over the course of their life (AIHW 2009c).

Critical aspects in reporting against this outcome include **contextual** factors relating to:

- physical and emotional safety of the immediate environment (*environment* domain); for example adequate shelter/housing, environments free from abuse and violence both within the home and in the community (such as child abuse and neglect, school bullying and being victims of violence), and reducing the risk of injuries
- community (*community* domain); for example, neighbourhood safety, and quality and cultural appropriateness of services.

Cultural appropriateness can be most simply considered in terms of the delivery of programs and services that are consistent with the cultural identity, communication styles, value systems and social networks of clients, program participants, and other stakeholders. While the cultural appropriateness of children's environments is an important issue, there are considerable challenges in defining and measuring it.

Outcome 3: Children have the knowledge and skills for life and learning

A child's learning and development are integral to his or her overall health and wellbeing, as well as the future productive capacity of society. The early years are a period of rapid brain development, and a stable, nurturing environment provides a strong base for learning. Attendance at early childhood education programs has been found to have beneficial effects on children's readiness for school and their ability to transition to full-time schooling. The early childhood years are also crucial for social and emotional development, which encompasses a broad range of skills that children need to develop to succeed at school and in life generally (AIHW 2009c).

Critical aspects in reporting against this outcome include **individual** factors relating to:

- early learning and education (*cognitive/learning* domain); for example through early learning (informal home-based activities) and early childhood education programs, and successful transition to primary school
- self-regulation, pro-social behaviour, social competence, self-perceived wellbeing, and emotional/behavioural difficulties (*social and emotional development and wellbeing* domain).

Outcome 4: Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children

The social, emotional and economic wellbeing of families plays a crucial role in determining children's health and wellbeing. Economically disadvantaged children are at a greater risk of poor health and education outcomes, both in the short and long term, and may be excluded from activities that other children take for granted. On the other hand, parental employment and adequate income protects against social exclusion and intergenerational disadvantage (AIHW 2009c).

Critical aspects in reporting against this outcome include **contextual** factors relating to:

- socioeconomic factors (*socioeconomic* domain); for example, parental education, income and employment
- system performance and service availability (*systems/services* domain); for example, access, affordability and quality of services required.

Outcome 5: Children are engaged in and benefiting from educational opportunities

A child's learning and development are integral to his or her overall health and wellbeing, and in the long term are essential for securing a job, and participating and connecting with the wider community. Regular school attendance helps children develop the basic building blocks for learning and educational attainment, and social skills such as friendship building, teamwork, communication and healthy self-esteem. Successful education outcomes during the primary school years and beyond are affected by several factors, including school attendance and the successful acquisition of literacy and numeracy skills (AIHW 2009c).

Critical aspects in reporting against this outcome include **contextual** factors relating to:

- school connectedness and engagement (community domain); for example, school attendance, and acquisition of literacy and numeracy skills.

Outcome 6: Families are confident and have the capabilities to support their children's development

Families play a crucial role in the lives of children, providing them with the physical, emotional and economic support. The relationships that children have with their family are among the most important influences on child development and psychological wellbeing. In addition, the social support parents are able to access through social institutions and through participating in formal and informal networks are strongly indicative of quality social relationships and interactions of mutual benefit and cooperation. Parental access to social support is strongly associated with children's healthy development and positive future outcomes (AIHW 2009c).

Critical aspects in reporting against this outcome include **contextual** factors relating to:

- relationships with parents, siblings, and peers; family functioning; family social network (such as being able to get help when needed); parenting quality/capacity; and other parental factors such as parental health (*family and/or peers* domain).

Outcome 7: Quality early childhood development services that support the workforce participation choices of families

The capacity of systems to deliver high-quality services plays a major role in influencing the health and wellbeing of children. High-quality early childhood development services provides support for a child's learning, socialisation, physical development and transition to school. The supply and expansion of early childhood education and care services allows parents to participate in the labour force and other activities. The accessibility, affordability and quality of these services are a key concern for parents (AIHW 2009c).

Critical aspects in reporting against this outcome include **contextual** factors relating to:

- system performance and service availability (*systems/services* domain); for example, access, affordability, availability and flexibility of hours, and quality of early childhood development services.

2.4 Indicator mapping

Following the framework review and the identification of key domains, an indicator mapping process was done on the 29 frameworks and domains discussed in Section 2.2 (see Table 2.1). National agreements and national partnership agreements were also considered in this mapping process, as significant work has been done to develop performance indicators under these agreements (see Appendix 2 for further details). In total, 48 frameworks were considered in this indicator mapping process, resulting in the identification of key indicator areas for the early childhood period.

Several steps were taken to determine and assess the importance and relevance of indicators in each of the frameworks:

1) Indicators were grouped into indicator areas, which represented a similar aspect or topic of health, development and wellbeing.
2) Indicator areas were assessed for their relevance as national outcome measure for early childhood development as defined in the strategy (that is, 0–8 years). Most of the frameworks covered a broader age range than the early childhood period, most commonly 0–17 years, spanning early childhood, middle childhood and late childhood/adolescence, so many indicators in the frameworks are not relevant. For example, indicators related to higher education, employment, and income are not relevant for an early childhood development reporting framework, but parental factors such as education, employment and income are.
3) Indicator areas related to a specific service or program that was only relevant in an international or jurisdictional context were not considered further.
4) Indicator areas included across multiple frameworks were recognised as potential key indicator areas for inclusion in an early childhood development reporting framework.

This indicator mapping process resulted in the identification of 43 key indicator areas relevant to early childhood development, which are mapped in Table 2.2 to the domains found through the framework review. The key domains outlined in Section 2.2 determined the individual and contextual factors that were most common across the frameworks reviewed. These domains, together with their mapping to the ECD Outcomes Framework (in Section 2.3), assisted in, and supported, the identification of these key indicator areas for reporting on early childhood development.

Table 2.2: Identified key indicator areas mapped to the framework domains

Individual factors				
Physical	**Psychological**	**Cognitive/learning**	**Social and emotional wellbeing/development**	**Behavioural**
Antenatal care	Mental health	Early learning (home-based)	Social and emotional development/wellbeing	Smoking in pregnancy
Mortality		Attending early childhood education programs		Alcohol and drug use in pregnancy
Preventable hospitalisations		Transition to primary school		Birthweight
Chronic conditions				Breastfeeding
				Nutrition
				Immunisation
				Developmental checks
				Overweight and obesity
				Physical activity
				Dental health
Contextual factors				
Family/peers	**Environment**	**Community**	**Socioeconomic**	**Systems and services**
Peer relationships	Parental substance use	Neighbourhood	Family economic situation	Accessibility of early childhood education and care services
Family interactions/ functioning	Child abuse and neglect	Literacy and numeracy	Parental education	Quality of early childhood education and care services
Parenting quality	Children as victims of violence	School attendance	Parental employment	Access to services
Parental and family health	Injuries	School engagement		Early intervention services
Teenage births	Shelter			
Family social network	Environment			
	Environmental tobacco smoke			

3 Literature review

A broad review of national and international literature was done to establish aspects of early childhood development most strongly associated with child health, development and wellbeing outcomes. This chapter summarises the key evidence and literature relating to early childhood development, and identifies the key indicator areas relevant to early childhood development outcomes.

The review identified a range of aspects critical to early childhood development beginning prenatally and continuing throughout childhood. Four broad concepts, encompassing multiple factors that interact and determine wellbeing, were identified:

- biological processes and physical development
- cognitive and language development
- socio-emotional development
- social and environmental contexts of development.

These broad concepts are consistent with the domains that were identified in the framework review.

This review identified 46 key areas most relevant to early childhood development. A summary of the results of the literature review supporting these key areas are included in Table 3.1 (more detailed summaries are presented in Appendix 3). This summary has been mapped to the ECD Outcomes Framework, which provides the organisational framework for reporting on early childhood development.

The literature review supported the 43 key indicator areas that emerged from the indicator mapping process in Chapter 2 and identified three additional areas as being important to early childhood development outcomes:

- electronic media
- parental involvement in education
- the affordability of early childhood education and care services.

Table 3.1: Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Children are born and remain healthy	
Antenatal care	Improving the access to and the quality of antenatal care can avert various poor maternal and child outcomes, such as maternal mortality, stillbirth and other perinatal mortality outcomes (Bhutta et al. 2009; Downe et al. 2009; Richardus et al. 2003).
Smoking in pregnancy	Smoking in pregnancy is associated with multiple adverse outcomes for children, such as preterm delivery, low birthweight, stillbirth, and infant mortality, particularly from sudden infant death syndrome, and lowered cognitive development in preschool-aged children. Smoking during pregnancy is the most important known modifiable risk factor for adverse outcomes (Aliyu et al. 2007; Chan & Sullivan 2008; Hoff et al. 2007; Jauniaux & Burton 2007; Julvez et al. 2007; Key et al. 2007; Salihu & Wilson 2007; Triche & Hossain 2007).
Alcohol and drug use in pregnancy	Alcohol and drug use during pregnancy affects both fetal and later child development. It can cause birth defects, and presents in a variety of disorders including intra-uterine growth retardation, intra-uterine death, fetal distress, premature delivery, low birthweight, major medical problems and infant mortality due to sudden infant death syndrome (Huestis & Choo 2002).

(continued)

Table 3.1 (continued): Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Children are born and remain healthy (continued)	
Birthweight	Birthweight is an indicator of general health for infants, and is a determinant of infant survival, health, development and wellbeing. Low birthweight is linked with increased risk of dying during the first year of life and long-term disability and disease. Low birthweight is associated with pre-term births, multiple births, substance abuse, socioeconomic disadvantage and poor maternal health and lifestyle. Many of these risks are amenable to interventions, such as good antenatal care and nutrition, controlling infections and limiting substance use (AIHW: Ford et al. 2003; AIHW: Laws et al. 2004; AIHW: Laws et al. 2007; Chomitz et al. 1995).
Breastfeeding	Infants are born with an immune system that is not fully developed, and breastmilk, containing mothers' antibodies, provides the best nutritional start in life. More exclusive and longer periods of breastfeeding reduces the risk of morbidity and mortality from infectious diseases, helps growth and cognitive development, and protects against diseases later in life (Horta et al. 2007).
Nutrition	Good nutrition is important in supporting the rapid growth and development that occurs during childhood. Children's eating choices are shaped by individual preferences, as well as cultural and family influences. It is important to establish healthy eating patterns at a young age, as overweight and obese children are at risk of serious health conditions in both the short and long term. Regular physical activity and good nutrition reduces cardiovascular risk in its own right, improves levels of cardiovascular risk factors such as overweight or obesity, high blood pressure and Type 2 diabetes, protects against some forms of cancer, and strengthens the musculoskeletal system (AIHW 2009b; NHMRC 2003).
Immunisation	Mortality and disease burden due to communicable disease has the potential to be considerable, and this is especially true in young children, whose immune systems are still developing. The reduction in mortality and morbidity in children in the last century is largely due to increases in immunisation, which protect against infectious diseases. Children who do not receive complete and timely immunisations remain at risk of contracting communicable illnesses, resulting in short-term and long-term health consequences (England et al. 2001; WHO 2005, 2007a).
Mortality	Infant mortality is used internationally as a key measure of population and child health. The majority of childhood deaths occur in the first year of life, and although Australia has shown significant progress in reducing infant and child deaths, social and economic factors remain powerful determinants of infant and child mortality (AIHW 2009c; Yu 2008).
Preventable hospitalisations	Potentially preventable hospitalisations are those for which hospitalisation could have been avoided through preventative care and early disease management, usually in the ambulatory care or primary care settings (general practice and community health services). Many causes of injury are preventable, so are amenable to intervention (CEHSEU 2009).
Chronic conditions	Chronic conditions in young children such as asthma, cancer, juvenile rheumatoid arthritis, congenital heart disease, cystic fibrosis, and Type 1 diabetes, can affect normal growth and development processes. Children with chronic conditions may also be at risk for adverse psychological outcomes depending on resistance/resilience factors relating to the child, or risk factors relating to the disease (Eiser 1997; Goodman 2001).
Developmental checks	Regular child developmental checks are important for disease prevention, and to recognise health conditions missed in earlier screenings or conditions developing since prior screenings. Screening for developmental delays and other health conditions potentially allows health professionals to intervene early and minimise negative academic and social outcomes (Nelson et al. 2006; Talen et al. 2007).
Overweight and obesity	Overweight and obese children are at a higher risk of being overweight and obese in adulthood. Some children may experience immediate health complications such as gallstones, hepatitis and sleep apnoea, or initiate the disease processes that lead to higher risks of morbidity and mortality later in life. Obesity can also affect social acceptance and self-esteem ;Griffiths et al. 2006; Guo et al. 2002, Hayden-Wade et al. 2005; Must & Strauss 1999).
Physical activity	Physical activity is important to maintain good health. Regular physical activity reduces cardiovascular risk factors such as overweight or obesity, and strengthens the musculoskeletal system. Children who have low levels of physical activity may be more likely to have high blood pressure, high cholesterol and insulin resistance/diabetes. Physical activity also improves the psychosocial wellbeing of children by reducing symptoms of depression, stress and anxiety and by improving self-confidence, self-esteem, energy levels, sleep quality and ability to concentrate (Andersen et al. 2006; Kohl et al. 2000b; Hills et al. 2007).

(continued)

Table 3.1 (continued): Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Children are born and remain healthy (continued)	
Dental health	Good oral health is necessary for many aspects of daily living, and can affect quality of life, social interactions and self-esteem. Conversely, poor dental health adversely affects children's health and wellbeing. Untreated dental caries facilitates abscess formation, cellulitis and the systemic spread of disease. Poor dental health can lead to failure to thrive and school absences that can negatively affect school performance (Berg & Coniglio 2006; Petersen 2003; Watt 2005).
Mental health	Children with mental health problems experience suffering, functional impairment, exposure to stigma and discrimination, and increased risk of premature death. For children with conditions such as attention deficit/hyperactivity disorder, depressive disorder or conduct disorder, there may be implications for their psychosocial growth and development, health care requirements, educational and occupational attainment and involvement with the justice system (Bhatia & Bhatia 2007; Laurel & Wolraich 2007; Patel et al. 2007).
Children's environments are nurturing, culturally appropriate and safe	
Peer relationships	Warm and strong peer relationships play a large role in determining childrens wellbeing and good mental health. Good peer relationships between children can help them to effectively resolve conflicts and maintain play, thereby building strong and enduring peer relationships. In some cases, however, deliberate acts that cause physical, psychological and/or emotional harm occurs in interactions between children. Bullying in Australian schools is widely recognised as a problem; the negative consequences of bullying include higher absenteeism, lower academic achievement, feeling unsafe at school, depression, and psychosomatic conditions. Bullying also contributes to maladjustment of children at school (Denham et al. 2003; Denham 2007; Guralnick 2010; Spector & Kelly 2006).
Parental substance use	Children of parents who are substance users (alcohol and/or illicit drugs) are at significantly increased risk of poor health and developmental delays. Risks for the child extends beyond being directly related to the substance abuse itself, and are closely bound up with parental psychopathology, parenting practices, family environment, and socioeconomic factors. Children of substance abusers are more at risk of developing anxiety and depression disorders, psychological, emotional, behavioural, and physical conditions (Dawe et al. 2006; Gruenert et al. 2004; Johnson & Leff 1999; NSW DoCS 2006; Patton 2003).
Child abuse and neglect	Child abuse and neglect can include physical abuse, emotional maltreatment, neglect, sexual abuse and the witnessing of family violence. Child abuse and neglect can have severe short-term and long-term effects on children's cognitive, socio-emotional and behavioural development. The adverse effects of abuse and neglect can last a lifetime, and the consequences are thought to be related to the type, severity and duration of abuse, and the context in which it occurs. Family stressors such as financial difficulties, limited social support, domestic violence, mental or physical disability, alcohol and substance abuse, and problems with unsafe, unsanitary or uninhabitable housing all contribute to the level of risk of abuse and neglect. Many of these factors are interrelated, so exacerbate the problems faced by some families (Glaser 2000; Green et al. 2010; Hildyard & Wolfe 2002; Layton 2003; Ronan et al. 2009; Tennant et al. 2003; Vic DHS 2002).
Children as victims of violence	Being a victim of violence can be detrimental to a child's health, sense of safety and security, and his or her feelings about the future. For some children, being victimised may lead to diminished educational attainment and social participation in early adulthood, or may result in physical injury, suicidal thoughts and behaviour, depression, disability and even death. Child sexual abuse has been associated with psychopathology, depression, anxiety disorder, phobias, panic disorder, post-traumatic stress disorder, substance abuse, and violent and sexual offending later in life (Arboleda-Florez & Wade 2001; Lee & Hoaken 2007; Macmillan & Hagan 2004; Molnar et al. 2001; Rick & Douglas 2007; Simon et al. 2002).
Injuries	In many developed countries, unintentional injury is a leading cause of mortality and disability in preschoolers, and declines in prevalence have not kept pace with decreases in mortality and disability from other causes. Death in infants and toddlers due to unintentional injuries commonly result from suffocation, falls, motor vehicle accidents, and drowning. Hospitalisation may also occur from burns and poisoning. Childhood injuries may also occur due to 'intentional' causes such as abuse and family/community violence, including homicide (Berry et al. 2010; Cripps & Steel 2006; Garzon 2005; Howard 2006; Schnitzer 2006; WHO 2006).
Shelter	Housing conditions and stability are closely linked to the social and emotional aspects of a child's health and wellbeing, and not merely structural features of the built environment. Adequate and stable housing enables people to engage with the wider community socially, recreationally, and economically, and can influence both physical and mental health (Vic DHS 2006; Wise 2003).

(continued)

Table 3.1 (continued): Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Children's environments are nurturing, culturally appropriate and safe (continued)	
Electronic media	Media technology can be a powerful teaching tool, but some negative outcomes have been linked to electronic media use. The impact of electronic media depends on the age of the child, the level of exposure, parental involvement in viewing, and the content of the media. Media exposure for children aged less than 2 years may negatively influence cognitive development, and high levels of non-educational media exposure at all ages are associated with some negative outcomes, most commonly obesity (Christakis et al. 2004; DoHA 2004; Kirkorian et al. 2008; Princeton University & Brookings Institution 2008; Zimmerman & Bell 2010).
Environment	Physical, chemical and biological conditions and agents can affect children's health, both positively and negatively. Children are particularly susceptible to environmental hazards due to biological and behavioural characteristics that can place them at increased risk of exposure to environmental contaminants, relative to adults. Environmental influences on health can be direct or indirect, obvious or subtle, straightforward or complex, and immediate or delayed (Pike-Paris 2004; Yassi et al. 2001).
Environmental tobacco smoke	Environmental tobacco smoke is one of the most hazardous environmental exposures for children. Tobacco smoke contains numerous toxic and cancer causing chemicals that increase the risk of adverse health outcomes for children, including sudden infant death syndrome, acute respiratory infections, middle-ear infection (otitis media), onset and increased severity of asthma, respiratory symptoms, and slowed lung growth. The benefits of reducing children's exposure to tobacco smoke include improved health and school performance, reduced absenteeism from school, reduced uptake of smoking, and less frequent smoking among children who smoke (CDC 2007; Commonwealth of Australia 2002; WHO 2007b).
Neighbourhood	The quality of the neighbourhood has been associated with positive outcomes for children, including lower levels of child maltreatment and youth delinquency, and higher levels of physical and mental health and educational attainment. One of the most common indicators of neighbourhood quality is parents' perception of safety (Ferguson 2006).
Children have the knowledge and skills for life and learning	
Social and emotional wellbeing	Broadly, social and emotional wellbeing refers to the way a person thinks and feels about themselves and others, and includes being able to deal with day-to-day stress, while leading a fulfilling life. There is an emphasis on how individuals experience positive behaviours and emotions, as well as how they adapt and cope with daily challenges. Skills children need to succeed at school and in life in general include managing and appropriately expressing emotions, regulating behaviour, resilience and coping skills, and confidence and persistence in learning. To maintain relationships, children need to learn to understand emotions and develop social skills and empathy. Parental and school characteristics such as warmth, boundaries and high expectations are also necessary. Children's social and emotional wellbeing may affect their mental and physical health, education and skill attainment, social competence, and relationships (Bernard et al. 2007; AIHW 2009b; Pitcl et al. 2006; Story et al. 2008).
Early learning (home-based)	A rich home learning environment and parental/carer support through shared learning activities is a key requirement for young children to reach cognitive development milestones. A rich home literacy environment has been shown to improve children's reading, vocabulary, general information, and letter recognition skills when entering kindergarten—all factors contributing to school readiness (Christian et al.1998; Glascoe & Leew 2010; Sénéchal 2006).
Parental involvement in education	Parents play a pivotal role in their child's educational outcomes by providing supportive and learning-compatible home environments, and by participating in child learning and skill acquisition. While this process begins with home support of early learning, parental involvement in school is also linked to various beneficial outcomes (Arnold et al. 2008; Edwards et al. 2008; Seginer 2006; Weiss et al. 2008).
Attending early childhood education programs	Early childhood education programs can help prepare children for formal schooling. It prepares children emotionally and socially and helps their motor skill, language and cognitive development, as well as increasing independence, sociability and concentration. Preschool programs may be especially positive for children from disadvantaged backgrounds where children may not be receiving adequate stimulation from the home environment (Barnett 2008; Biedlinger 2009; Burchinal et al. 2009; Elliott 2006; Moore 2008; Rosenberg et al. 2008).

(continued)

Table 3.1 (continued): Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Children have the knowledge and skills for life and learning (continued)	
Transition to primary school	Children entering school with basic skills for life and learning are more likely to have a successful transition to primary school. Schooling transition issues relate to emotional competence, capacity for engagement with others, and resilience in meeting the demands of schooling. Children who make a successful transition to school have higher levels of social competence and academic achievement compared with those who have difficulty making this transition (AIHW 2009c; Shepard & Smith 1989).
Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children	
Family economic situation	For most families, household income is the most important determinant of their economic situation. Children living in low-income households are more likely to have insufficient economic resources to support a minimum standard of living, and this can affect a child's nutrition, access to medical care, the safety of his or her environment, level of stress in the family, and the quality and stability of care. A primary concern of economically disadvantaged children is being excluded from activities that other children appear to take for granted, and the embarrassment that this can cause (ABS 2006a; AIHW 2009c).
Parental education	Parental education (especially maternal education) is a significant factor in child development, and influences many aspects of a child's daily experience, such as interactions with the child, quality of the home environment, family functioning, community environment, school choice, and socioeconomic context. Low maternal education is related to various adverse health outcomes for the child, such as decreased use of antenatal care, low birthweight, smoking during pregnancy, stillbirths and other forms of infant mortality, lower likelihood of starting and persisting with breastfeeding (Acevedo-Garcia et al. 2007; Arntzen et al. 2008; du Prel et al. 2006; House of Representatives 2007; Kalil et al. 2009; Luo et al. 2006; WHO 2007c; Yu 2008).
Parental employment	Parental employment increases the economic resources available to families, and protects against social exclusion and inter-generational disadvantage, as well as providing a positive role model for children in terms of work ethics and social responsibility. Secure employment provides financial stability, self-confidence and social contact for parents, with positive effects flowing on to children (AIHW 2009c).
Access to services	The availability and accessibility of health, welfare and social services to mothers, families and young children, as well as their performance in delivering timely and appropriate care, affect child outcomes, particularly in physical health domains, but also in mental health and wellbeing. Access to services can be important for children's social and behavioural outcomes, but affordability and cultural appropriateness are critical barriers for many families in accessing quality education programs and early intervention services (Brameld et al. 2006; Tran et al. 2002).
Children are engaged in and benefiting from educational opportunities	
Literacy and numeracy	Literacy and numeracy skills acquired in the schooling years are the building blocks for further educational attainment, social development and employment. National benchmarks in literacy and numeracy represent the minimum acceptable standard below which a student will have difficulty making enough progress at school. Academic performance in early grades is considered a significant predictor of children's retention in high school and secondary college. Proficiency in literacy and numeracy is essential for day-to-day living (AIHW 2009c).
School attendance	Regular school attendance is critical to successful student outcomes, helping children to develop the basic building blocks for learning and educational attainment, as well as social skills, such as friendship building, teamwork, communication skills and healthy self-esteem. Children who are regularly absent from school are at risk of missing out on these critical stages of educational development and may experience long-term difficulties with their learning, low self-esteem, social isolation and dissatisfaction (Vic DHS 2006).
School engagement	School engagement incorporates behavioural, emotional and cognitive dimensions, which interact to determine child outcomes. A lack of engagement in these dimensions can result in: negative behaviour (such as breaking rules and disruptive behaviours); lack of involvement in learning tasks and other school-related activities; boredom; sadness; limited investment in learning, including lack of motivation and self-regulation. In addition to academic development, engagement can also affect socio-emotional development, as students who are more engaged tend to have higher levels of wellbeing (Birch & Ladd 1997; Buhs & Ladd 2001; Finn & Rock 1997; Fredricks et al. 2004; Jennings 2003; Jimerson 2003; Lippman & Rivers 2008).

(continued)

Table 3.1 (continued): Summary of the research evidence on key areas affecting early childhood development

Key area	Research evidence
Families are confident and have the capabilities to support their children's development	
Family interaction/ functioning	Families are typically the most important socialising agent for children. A family with high levels of family functioning interacts effectively to provide the best environment for their children, who grow up to be strong, resilient, and emotionally healthy, and can cope well with adverse conditions. Aggressive behaviour and delinquency in children and young adults also has a strong association with family dysfunction, as does bullying involvement (as bullies and victims) ((DeFrain 1999; Fergusson & Horwood 2002).
Parenting quality	Parenting quality and style, including the way in which a parent interacts with, cares for, instructs, and reacts to the child, can have lasting effects on that child's development, attitudes and outcomes, shaping his or her capacity to cope and adapt throughout childhood (Collins et al. 2000).
Parental and family health	Living with a chronically ill parent or parent or sibling with disability can negatively affect a child's health and wellbeing. While many parents who have a chronic illness or disability are capable parents, these health problems can affect the parent–child relationship. Depending on the severity of the parental illness or disability, the wellbeing of children may be affected by factors such as family discord, discontinuity of care, poor parenting skills, social isolation, and poverty, and they may experience developmental delays (ABS 1999; AICAFMHA 2001; McConnell et al. 2003).
Teenage births	Teenage births are associated with significant health and social problems for both infant and mother. There may be long-term effects on the ability of the mother to care for her infant due to interrupted schooling, problems entering the labour market, and a high likelihood of economic hardship. Health risks include low birthweight due to either prematurity or intra-uterine growth restriction, infection, chemical dependence (due to maternal substance abuse) and sudden infant death syndrome (Malamitsi-Puchner & Boutsikou 2006; Sleebos 2003).
Family social network	Family social networks are an important part of the social context in which a child develops, promoting reciprocity and trustworthiness. Families with rich social networks have increased access to information, material resources and friends and neighbours to help them manage their daily lives and problems. Strong social networks may protect children against the adverse effects of socioeconomic disadvantage (Ferguson 2006; Stone & Hughes 2000; Zwi & Henry 2005).
Early intervention services	Children who have or are at risk of developing disabilities or developmental delays can receive considerable benefit from focused programs designed to prevent or minimise adverse cognitive, emotional, physical or material limitations. These programs aim to improve child development and wellbeing, avert the need for special education or institutionalisation, provide family support, increase community participation and social inclusion (Blackman 2003; Early Childhood Intervention Australia 2007; Johnston 2006).
Quality early childhood development services that support the workforce participation choices of families	
Quality	High-quality early childhood education and care services can be beneficial to a child's cognitive, socio-emotional and physical development, and the benefits may be particularly significant among economically disadvantaged children. While research on the risks and/or benefits of very early attendance is mixed, the outcomes appear to be determined by the interplay of interactions with caregivers and other children, as well as the quality, quantity, and type of care provided (Belsky et al. 2007; Campbell et al. 2002; Cassells et al. 2005; Dearing 2009; Harrison 2008; NICHD 2005; Reynolds 2000).
Accessibility	Access barriers to early childhood education and care services are significant. Places are in high demand, and waiting lists can be extensive. The cost and availability of early childhood education and care often acts as a barrier, particularly for lower-income families, who have the most to gain from high-quality care (Campbell et al. 2002; Dearing 2009; Lippman et al. 2008; Reynolds 2000).
Preschool/child care affordability	In some Australian states and territories preschool services are delivered by the non-government sector for a fee. The cost of early childhood education and care often acts as a barrier, particularly for lower-income families, who have the most to gain from high-quality care. The capacity of a family to pay for early childhood education is dependent on: income; eligibility for subsidies and rebates; the fees charged and other associated costs; the number of children in early childhood education; and the broader costs incurred by the family (Campbell et al. 2002; Dearing 2009; Lippman et al. 2008; Reynolds 2000).

4 Indicator areas for early childhood development

The objective of the early childhood development national outcome measures project is to develop an indicator-based reporting framework, to enable achievements to be monitored against the ECD Outcomes Framework in the ECD Strategy. The process for developing this reporting framework has involved reviewing national and international frameworks (Chapter 2), mapping identified frameworks to find relevant indicator areas (Chapter 2), reviewing existing literature relevant to early childhood development (Chapter 3), and consulting with stakeholders and key experts.

This chapter identifies the key indicator areas relevant for a reporting framework for early childhood development, and describes the process to refine and reduce the number of indicator areas.

4.1 Identification of key indicator areas

The indicator mapping and review of literature found 46 key indicator areas that were most relevant for a reporting framework for early childhood development (Table 4.1).

The key indicator areas identified in chapters 2 and 3 cover both individual and contextual factors, determined as essential to present a holistic view of early childhood development and wellbeing outcomes. They are also consistent with an ecological model of human development, as they take into account factors affecting children at various levels—from the family, early childhood education and school settings, through to parental employment and family social networks, the community and broader society.

In Table 4.1 the key indicator areas have been mapped to the ECD Outcomes Framework, which provides the organisational framework for reporting on early childhood development. The Children's Headline Indicators exist in 19 of these 46 key indicator areas (refer to Appendix 4 for further details).

The consultation process supported these 46 key indicators areas as relevant to early childhood development. However, there was strong support that a reporting framework for the ECD Outcomes Framework should aim to measure progress in key early childhood outcomes, and be limited to the 'critical few'.

Table 4.1: Potential indicator areas mapped to ECD Outcomes Framework

Children are born and remain healthy				
Antenatal care	Smoking in pregnancy[(a)]	Alcohol and drug use in pregnancy	Birthweight[(a)]	Breastfeeding[(a)]
Nutrition	Immunisation[(a)]	Mortality (infant[(a)], perinatal, under 5 years)	Preventable hospitalisations	Chronic conditions
Developmental checks	Overweight and obesity[(a)]	Physical activity	Dental health[(a)]	Mental health
Children's environments are nurturing, culturally appropriate and safe				
Peer relationships	Parental substance use	Child abuse and neglect[(a)]	Children as victims of violence	Injuries[(a)]
Shelter[(a)]	Electronic media	Environment	Environmental tobacco smoke	Neighbourhood
Children have the knowledge and skills for life and learning				
Social and emotional development/wellbeing[(a)]	Early learning (home-based)	Parental involvement in education	Attending early childhood education programs[(a)]	Transition to primary school[(a)]
Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children				
Family economic situation[(a)]	Parental education	Parental employment	Access to services	
Children are engaged in and benefiting from educational opportunities				
Literacy/Numeracy[(a)]	School attendance[(a)]	School engagement		
Families are confident and have the capabilities to support their children's development				
Family interaction/functioning	Parenting quality	Parental and family health	Teenage births[(a)]	Family social network[(a)]
Early intervention services				
Quality early childhood development services that support the workforce participation choices of families				
Quality of early childhood education service	Accessibility of early childhood education service	Preschool/child care affordability		

(a) Children's Headline Indicator Priority Area.

4.2 Refining the number of indicator areas

Reporting against 46 key indicator areas is a significant commitment, and overlaps with many other reporting frameworks that already exist. Through the consultation process it was determined that there needs to be a smaller set of high-level indicators for early childhood development, which will measure progress for each of the seven outcomes in the ECD Outcomes Framework. The approach to achieve this involved:

- developing conceptual models for each outcome in the outcomes framework
- assessing and selecting each indicator area according to specific criteria
- conducting a workshop to gain agreement on a set of high-level indicators for early childhood development.

Conceptual models

Conceptual models for each of the early childhood development outcome areas were developed based on the relationships between indicator areas found in the literature review (refer to Chapter 3). These models enabled a count of the relationships between key indicator areas within and across the outcomes in the ECD Outcomes Framework (hereafter referred to as outcome areas). So the conceptual models help establish: the indicator areas with the highest number of relationships within and across early childhood development outcome areas; and which indicator areas should be kept.

This approach was taken, as it could incorporate findings from studies using a wide variety of methods. However, it does have limitations, as the count relies only on those relationships highlighted by the literature review, which may be subject to publication or reviewer bias. The literature review may find commonly studied and reported variables, but it is possible that some potentially important aspects do not appear in current literature, due to difficulties involved in studying some constructs.

The large number of indicator areas under consideration also meant that statistical techniques to determine those that contribute the most to early childhood development and wellbeing outcomes could not be used. Statistical methods to combine evidence or to determine the predictive validity of indicator areas could not be used due to inconsistencies in the variety of methods and measures used in different research studies underlying the literature, as well as the multitude of studies considered that do not look at the same constructs. In addition, while statistical relationships or associations between two or three variables can be relatively easily interpreted, it would not be possible to interpret the complex associations between all the indicator areas in this project. So, given the complexity of the number of factors that influence children's outcomes, it was not considered appropriate to try to isolate the variables with the strongest statistical associations, because this would mean relying on a subset of research, rather than on the body of scientific literature as a whole.

The conceptual models enabled the identification of:

- process indicator areas that have direct and/or indirect relationships with outcome indicator areas within each outcome area
- a count of the number of relationships between indicator areas within and across all seven outcome areas
- the outcome area with the most relationships with indicator areas in all other early childhood development outcome areas.

The count of relationships was also important in:

- assessing the contribution of indicator areas separately within each of the early childhood development outcome areas to establish the most important indicator areas
- assessing the contribution of indicator areas across all seven outcome areas to find indicator areas that have a strong overall contribution, but may contribute relatively less within a particular outcome area
- determining the outcome area with the most relationships across all seven outcome areas.

The number of relationships found for each indicator area using the conceptual models was tallied in three ways:

1) relative contribution of indicator areas **within** an outcome area
2) relative contribution of each indicator area **across** all seven outcome areas
3) relative contribution of indicators areas **regardless** of early childhood development outcome area.

The tallies for the first two were summed, which enabled the results to be ranked for an outcome area, either within or across early childhood development outcome areas. The tallies also allowed for an overall ranking, regardless of outcome area, to be calculated. Table 4.2 provides details of the results of the tally of relationships found for each indicator area within and across outcome areas, and the ranking of the indicator area overall in relation to the number of associations, regardless of outcome area. Further detail on the count of relationships across all seven outcome areas are provided in Appendix 5.

Table 4.2: Summary of the conceptual models in establishing a refined list of indicator areas

Indicator areas	For outcome area		Overall	
	High number of relationships [(a)]	Ranking[(a)]	High number of relationships[(b)]	Ranking[(b)]
Outcome 1: Children are born and remain healthy				
Mental health	✓	1	✓	3
Chronic conditions	✓	2	✓	7a
Mortality	✓	3	✓	8
Overweight and obesity	✓	4	✓	10a
Birthweight	✓	5	✓	12a
Breastfeeding	✓	6	✓	14a
Antenatal care	✓	7	✓	15a
Smoking in pregnancy	✓	8	✓	15b
Dental health		9		14b
Nutrition		10		16a
Alcohol and drug use in pregnancy		11		17a
Preventable hospitalisations		12		17b
Physical activity		13		20a
Immunisation		14		22
Developmental checks		15		23a
Outcome 2: Children's environments are nurturing, culturally appropriate and safe				
Peer relationships	✓	1	✓	9a
Neighbourhood	✓	2	✓	11a
Parental substance use	✓	3	✓	10b
Shelter	✓	4	✓	12b
Child abuse and neglect	✓	5	✓	13
Injuries		6		16b

(continued)

Table 4.2 (continued): Summary of the conceptual models in establishing a refined list of indicator areas

Indicator areas	For outcome area		Overall	
	High number of relationships [(a)]	Ranking[(a)]	High number of relationships[(b)]	Ranking[(b)]
Outcome 2: Children's environments are nurturing, culturally appropriate and safe (continued)				
Children as victims of violence		7		17c
Environment		8		19a
Electronic media		9		19b
Environmental tobacco smoke		10		23b
Outcome 3: Children have the knowledge and skills for life and learning				
Social and emotional wellbeing	✓	1	✓	2
Transition to primary school	✓	2	✓	12c
Parental involvement in education		3		19c
Early learning (home-based)	✓	3		18b
Attending early childhood education programs		4		18a
Outcome 4: Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children				
Family economic situation	✓	1	✓	1
Parental education	✓	2	✓	5
Access to services		3	✓	6a
Parental employment		4		18c
Outcome 5: Children are engaged in and benefiting from educational opportunities				
Literacy and numeracy	✓	1	✓	4
School engagement	✓	2		16c
School attendance		3		15c
Outcome 6: Families are confident and have the capabilities to support their children's development				
Teenage births	✓	1	✓	6b
Parenting quality	✓	2	✓	7b
Family social network	✓	3	✓	9b
Family interaction/functioning	✓	3	✓	9c
Parental and family health		4	✓	12d
Early intervention services		5	✓	11b
Outcome 7: Quality early childhood development services that support the workforce participation choices of families				
Quality of early childhood development service	✓	1		15d
Accessibility of early childhood development service	✓	2		20b
Affordability of early childhood development service		3		21

(a) Defined as those indicator areas that fall into the top 50% when results are tallied for an early childhood development outcome area.

(b) Defined as those indicator areas that fall into the top 50% regardless of early childhood development outcome area.

Early childhood development outcome area most related with all other outcome areas

Another purpose of developing the conceptual models was to help establish which of the early childhood development outcome areas had the highest number of relationships with other outcome areas. When looking at relationships of indicator areas across all seven outcome areas, the conceptual models revealed that Outcome 4 'Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children' was most highly related with all other outcome areas. The assessment of the contribution of individual indicator areas under Outcome 4—such as family economic situation, parental education and access to services—showed that these indicators are the main reason for Outcome 4 being the most highly related outcome area. Using the tally of indicators across all early childhood development outcome areas, family economic situation is the most highly related indicator area, and parental education and access to services fall within the top six.

The research and literature supports the significant contribution that determinants such as socioeconomic status, employment status, parental education, housing, social support and availability of services have on early childhood development outcomes. Therefore, it was strongly supported that the indicator areas in Outcome 4 be used as disaggregations for reporting on the selected indicators where relevant and feasible.

In addition, reporting against the ECD Outcomes Framework will also need to consider the relevance of reporting at the national or state and territory level, as well as disaggregation by sub-populations of children—for example, age, sex, Indigenous status, ethnicity, geographic location, disability status and socioeconomic disadvantage.

Selection of indicator areas

A workshop bringing together key experts and stakeholders was held to establish a set of high-level indicators for early childhood development to measure progress for each of the outcomes in the ECD Outcomes Framework. The workshop considered the 46 key indicator areas, and assessed their suitability based on their relevance to the ECD Strategy and the tally of relationships (see Appendix 6 for a list of workshop participants).

The following criteria were also used to further help reduce the number of indicator areas:

- reliable and comparable national and state and territory data exists for relevant indicator(s), or will by 2014
- data collection(s) can be reported regularly to meet COAG reporting requirements
- relevant indicator areas are measurable over time
- relevant indicator areas are sensitive to intervention and amenable to change
- relevant indicator areas have a clear meaning, cannot be misinterpreted, and are based on sound empirical evidence
- relevant indicator areas are measurable for diverse populations (for example, Aboriginal and Torres Strait Islander children or those geographically or socioeconomically disadvantaged).

The consultation process also recognised that it was important to select an appropriate age range and indicator areas that align with relevant COAG indicators. The indicative progress measures in the broader COAG frameworks for participation and productivity and for Indigenous early childhood development were used as a starting point for selecting indicator

areas. The indicators selected align with current national information agreements and performance indicators.

The age range specified in the ECD Strategy for program and policy formulation is from the antenatal period to 8 years. However, the selection of indicator areas must also be age-appropriate and reflect the level of development of children at a particular age, and for this reason a rigid age range structure was not applied across all indicator areas. For some indicators, data are needed beyond 8 years to measure the success of interventions, which may occur before 8 years. An upper age range of 12 years was generally regarded as sufficient, and is consistent with the Children's Headline Indicator reporting. In addition, there was strong support that the lower age range incorporates the antenatal period, as the vision in the strategy refers to 'all children having the best start to life', reflecting the importance of influences in the antenatal period.

Table 4.3 outlines the results of these considerations, the count of relationships for each of the 46 indicator areas, and the outcomes of the discussions at the workshop. The indicator areas shaded in Table 4.3 align with current national reporting processes and evidence-base, and received a high level of support through the consultation and review process as the key indicators to measure progress against the ECD Outcomes Framework.

Table 4.3: Rationale for the selection of indicator areas for the outcomes framework

Indicator area	Rationale for inclusion/exclusion	Comments
Outcome 1: Children are born and remain healthy		
Antenatal care	Lower ranking in outcome 1 (6) and overall (14)	
Smoking in pregnancy	Children's Headline Indicator priority area	
	Lower ranking in outcome 1 (7) and overall (15)	
Birthweight	Children's Headline Indicator priority area	
	COAG indicative progress measure	
	Very high ranking in outcome 1(5)	
	Internationally comparable	
Breastfeeding	Children's Headline Indicator priority area	Considered important to include, although there are challenges in its definition and measurement. Further clarification and development required to ensure consistency with national and international definitions.
	Relevance endorsed through the National Breastfeeding Strategy	
Mortality	Children's Headline Indicator priority area	Crucial indicator of the health of a population; particularly important for disadvantaged populations.
	Very high ranking in outcome 1 (3) and overall (8)	Infant mortality indicator considered the most appropriate for the age range of the strategy.
	Internationally comparable	

(continued)

Table 4.3 (continued): Rationale for the selection of indicator areas for the outcomes framework

Indicator area	Rationale for inclusion/exclusion	Comments
Outcome 1: Children are born and remain healthy (continued)		
Chronic conditions	Very high ranking in outcome 1 (2) and overall (7)	Indicator measurement sensitive to education campaigns, diagnostic practices and management of condition.
Overweight and obesity	Children's Headline Indicator priority area Very high ranking in outcome 1 (4) and overall (10)	Strong support for indicator; specifically mentioned in the strategy as an area of concern. Definition should align with Children's Headline Indicator project. Not appropriate to report for children aged less than 5 years.
Dental health	Children's Headline Indicator priority area Lower ranking in outcome 1 (7) and overall (15)	
Mental health	Very high ranking in outcome 1 (1) and overall (3)	Complex indicator with many measurement, collection and reporting challenges. Recommended that the term 'mental health' be replaced with child behavioural problems.
Child behavioural problems	Recommended to replace mental health indicator area	Strong support at the workshop that information based on clinical diagnosis of a mental health condition/disorder may not be the most appropriate measure among children. A measure on child behavioural problems was regarded as more suitable for the age range under consideration. Measure using the Strengths and Difficulties Questionnaire, reflecting the parent-level reporting in the questionnaire, may be appropriate.
Nutrition, alcohol and drug use in pregnancy, preventable hospitalisations, physical activity, immunisation, developmental checks	Lower ranking in outcome 1 and overall	Measurement and data collection issues with reporting on alcohol use in pregnancy. Immunisation considered important, but well covered in other national agreements and reporting activities.
Outcome 2: Children's environments are nurturing, culturally appropriate and safe		
Peer relationships	Very high ranking in outcome 2 (1) and overall (9)	Support for an indicator for this area, but it was noted that considerable indicator and data development is required to clarify definitional and measurement issues.
Parental substance use	Very high ranking in outcome 2 (3) and overall (10)	Parental substance use is highly correlated with child abuse and neglect, but as child abuse and neglect was recommended for inclusion, it was not considered further for inclusion.
Child abuse and neglect	Children's Headline Indicator priority area Very high ranking in outcome 2 (5)	Indicator reflects child protection activity, and child protection data is sensitive to changes in child protection legislation and departmental policies, practices, resources and data systems.

(continued)

Table 4.3 (continued): Rationale for the selection of indicator areas for the outcomes framework

Indicator area	Rationale for inclusion/exclusion	Comments
Outcome 2: Children's environments are nurturing, culturally appropriate and safe (continued)		
Shelter	Children's Headline Indicator priority area Very high ranking in outcome 2 (4) Strong associations with the indicator areas: neighbourhood, parental substance use, and environment	
Neighbourhood	Very high ranking in outcome 2 (2)	Challenging to define and measure. Current measures are limited to safety indicators, not quality of neighbourhood.
Injuries, children as victims of violence, environment, electronic media, environmental tobacco smoke	Lower ranking in outcome 2 and overall	
Cultural appropriateness	Culturally appropriate component of this outcome not currently captured by above indicator areas	General agreement to include an interim indicator on Indigenous discrimination until a broader indicator was developed that extended to other ethnic groups and other forms of discrimination. Further data development is required to capture population level data on the experiences and treatment of children from diverse cultural and ethnic backgrounds, such as refugee and migrant families.
Outcome 3: Children have the knowledge and skills for life and learning		
Social and emotional wellbeing	Children's Headline Indicator priority area Very high ranking in outcome 3 (1) and overall (2)	
Early learning (home-based)	Very high ranking in outcome 3 (3)	The age range for this indicator to be determined, but should be those age 0–2 and 3–8s.
Parental involvement in education	Very high ranking in outcome 3 (3), however lower ranking overall (19)	Challenging to capture the type and amount of educational involvement in multiple settings.
Attending early childhood education programs	Children's Headline Indicator priority area COAG indicative progress measure	Recommended that due to the similar concepts this indicator area be moved to Outcome 5 and be captured in a single indicator on preschool and school attendance. Further investigation required to determine extent of methodological issues in different definitions, data collections and scope for preschool and school attendance. Noted that while it would be preferable if both components could be sourced from a single data source, should this not be feasible this indicator area may require two measures.
Transition to primary school	Children's Headline Indicator priority area COAG indicative progress measure Very high ranking in outcome 3 (2)	A process is currently under way to establish the most suitable method for reporting on this priority area for the Children's Headline Indicators project. The outcome of that process will inform how this indicator is defined and reported on in the outcomes framework.

(continued)

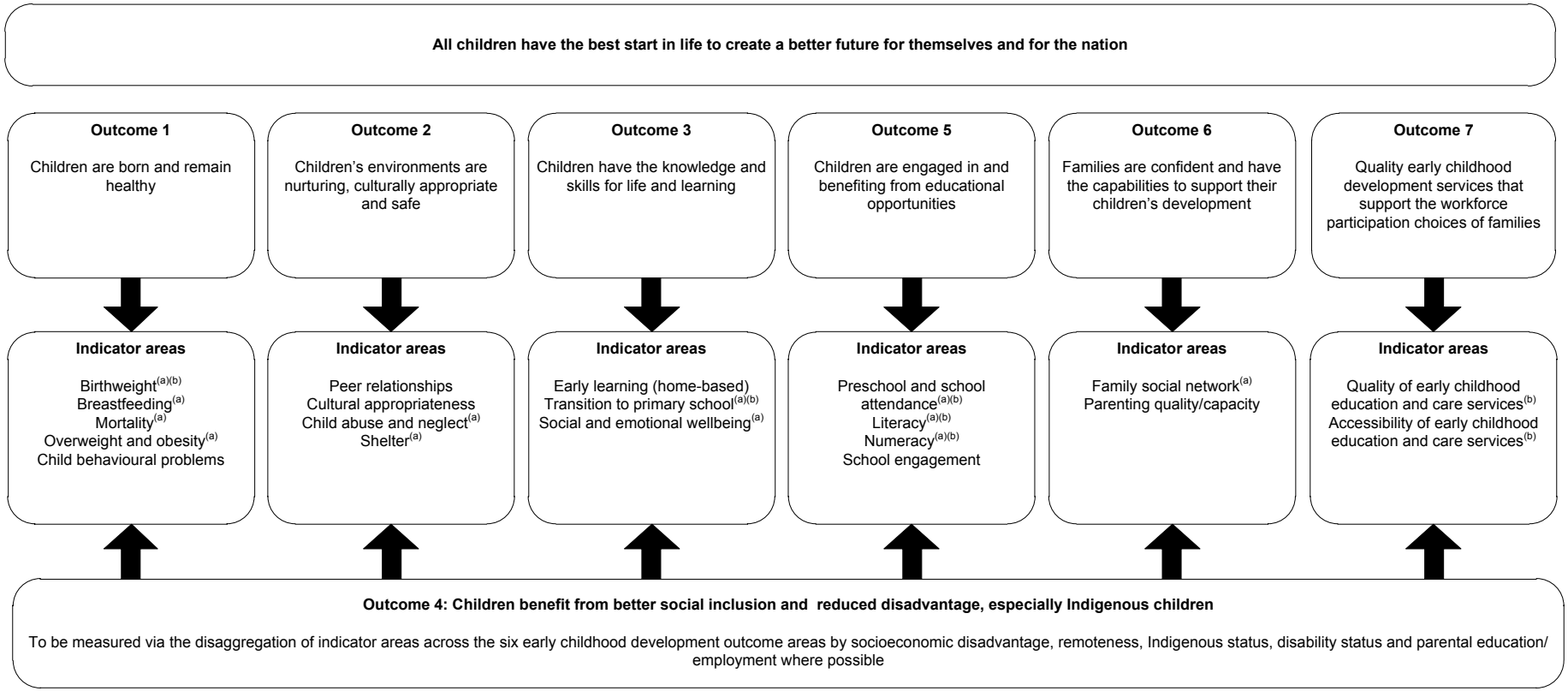
Table 4.3 (continued): Rationale for the selection of indicator areas for the outcomes framework

Indicator area	Rationale for inclusion/exclusion	Comments
Outcome 4: Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children		
Family economic situation Parental education Parental employment Access to services (remoteness)	Indicator areas for Outcome 4 were identified as being highly associated with all other early childhood development outcome areas. Due to this high level of association, these indicator areas, along with disability status, will be used as disaggregations for reporting for all other indicator areas, where available.	
Outcome 5: Children are engaged in and benefiting from educational opportunities		
Literacy and numeracy	Children's Headline Indicator priority area COAG indicative progress measure Very high ranking in outcome 5 (1) and overall (4)	Strong policy commitment to include these areas. The most relevant measure is reading and numeracy at Year 3.
School attendance	Children's Headline Indicator priority area COAG indicative progress measure Very high ranking in outcome 5 (3)	Strong policy commitment to include these areas. To be captured in a single indicator on preschool and school attendance.
School engagement	Very high ranking in outcome 5 (2)	Strong support to include this area, despite the challenges in defining and measuring it, and the absence of reliable national information.
Outcome 6: Families are confident and have the capabilities to support their children's development		
Teenage births	Children's Headline Indicator priority area Very high ranking in outcome 6 (1) and overall (6)	This area was not supported because it was felt that other indicators would better capture population level change, and could have a greater impact on children and family functioning.
Parenting quality/capacity	Very high ranking in outcome 6 (2 and 3) and overall (7 and 9)	Support to include this area, despite the challenges in defining and measuring it, and the absence of reliable national information. Further indicator and data development required to establish the most important aspects of parenting quality and capacity in terms of early childhood development reporting. This indicator area will also incorporate aspects of family interaction/ functioning.
Family social network	Children's Headline Indicator priority area Very high ranking in outcome 6 (3) and overall (9)	Support to include this area, despite the limited national data to support its measurement, and the fact that available measures are subjective.
Parental health, early intervention services	Lower ranking in outcome 6	
Outcome 7: Quality early childhood development services that support the workforce participation choices of families		
Quality of early childhood development service	Very high ranking in outcome 7 (1)	Planned national assessment of childcare services to be introduced, with a rating to indicate whether services are meeting, exceeding, or not meeting the National Quality Standard (from July 2010, fully operational in 2014). Agreed that the rating against the quality standard was a suitable measure.
Accessibility of early childhood development service	Very high ranking in outcome 7 (2)	Indicator will reflect unmet need for early childhood care services.
Affordability of early childhood development service	Lower ranking overall (21)	Challenging to measure.

Based on the outcomes from the workshop, 20 indicator areas were recommended as the 'critical few' to measure progress against the ECD Outcomes framework in the ECD Strategy (Figure 4.2). Of these:

- 12 are the Children's Headline Indicators
- 7 are relevant indicative progress measures on the COAG participation and productivity agenda outcomes framework
- 5 are additional indicators to ensure there is coverage across all outcomes areas in the ECD Outcomes Framework.

Those indicator areas that have not been selected for inclusion in the ECD Outcomes Framework may still be reported on nationally, through other reporting mechanisms, such as the Children's Headline Indicators or *A picture of Australia's children* (AIHW 2009c).



(a) Children's Headline Indicator priority area.

(b) COAG participation and productivity agenda indicative progress measures.

Figure 4.2: Recommended high-level indicator areas for the Early Childhood Development Reporting Framework of the National Early Childhood Development Strategy

4.3 Selection of indicators for the Early Childhood Development Reporting Framework

In deciding which indicator would be most suitable to measure progress against the indicator areas for the ECD Outcomes Framework, several issues were considered, based on the indicator selection criteria below. It is unlikely there will be an ideal indicator that strictly meets all these criteria, but the indicator should be chosen according to which indicator best fits the criteria, particularly in the area of data availability. These criteria include whether the indicator is:

- worth measuring—that is, does it reflect how Australian children were faring for a broad conceptual issue
- relevant to current Australian and state/territory government policy agendas
- sensitive to intervention and amenable to change
- clear in meaning, easily interpreted, and based on sound empirical evidence
- able to be reported using data collected, analysed and reported in a statistically reliable and valid way, and measured consistently and repeatedly over time
- capable of reflecting differences and diversity.

For reporting against the ECD Outcomes Framework only one indicator can be selected for each indicator area.

Further to these criteria, participants at the workshop agreed that the selection and definition of the indicators should align with other national indicator frameworks, particularly the Children's Headline Indicators (refer to Appendix 4).

Table 4.4 identifies the key national indicators for reporting against the Early Childhood Development Reporting Framework of the ECD Strategy, and their associated data sources and frequency of collection. The identification of these indicators align with current national reporting processes and evidence-base, and received a high level of support through the consultation and review process as the most suitable indicators for an ECD reporting framework. So it is recommended that these 20 indicators be reported on against the ECD Outcomes Framework in the ECD Strategy.

Table 4.4: Key national indicators for reporting against the ECD Outcomes Framework in the ECD Strategy

Indicator area	Indicator	Data source(s)	Frequency of collection
Outcome 1: Children are born and remain healthy			
Birthweight	Proportion of live born infants of low birthweight	AIHW National Perinatal Data Collection	Annual
Breastfeeding	Proportion of infants exclusively breastfed at 4months of age[(a)]	National Infant Feeding Survey (from 2011)	Unknown
Mortality	Mortality rate for infants aged less than 1 year	AIHW Mortality Database	Annual
Overweight and obesity	Proportion of children who are overweight and obese for their age and sex	Australian Bureau of Statistics National Health Survey	3 yearly
Child behavioural problems	Indicator to be developed[(b)]	To be determined	
Outcome 2: Children's environments are nurturing, culturally appropriate and safe			
Peer relationships	Indicator to be developed[(b)]	To be determined	
Cultural appropriateness	Indicator to be developed[(b)]—interim indicator proposed for Indigenous discrimination	National Aboriginal and Torres Strait Islander Social Survey	6 yearly
Child abuse and neglect	Rate of children who were the subject of child protection substantiation in a given year	AIHW Child Protection Data Collection	Annual
Shelter	Proportion of children aged 0–12 years living in households experiencing at least one of the specified aspects of housing disadvantage (homelessness, overcrowding, housing stress, forced residential mobility)[(a)]	Australian Bureau of Statistics Census of population and housing	5 yearly
		Australian Bureau of Statistics Survey of Income and Housing	2 yearly
Outcome 3: Children have the knowledge and skills for life and learning			
Early learning (home-based)	Proportion of children aged 0–8 years who are read to by a parent on a regular basis	Australian Bureau of Statistics Survey of Childhood Education and Care	3 yearly
Transition to primary school	Proportion of children entering school with basic skills for life and learning (under development)	Australian Early Development Index	Unknown
Social and emotional wellbeing	Proportion of children scoring 'of concern' on the Strengths and Difficulties Questionnaire[(a)]	No national data source currently available	
Outcome 5: Children are engaged in and benefiting from educational opportunities			
Preschool and school attendance	Proportion of children attending an early educational program in the year prior to beginning primary school[(a)]	Early Childhood Education and Care National Data Collection (from 2011)	Annual
	Attendance rate of children at primary school	Ministerial Council for Education, Early Childhood Development, and Youth Affairs National Report on Schooling in Australia	Annual

(continued)

Table 4.4 (continued): Key national indicators for reporting against the ECD Outcomes Framework in the ECD Strategy

Indicator area	Indicator	Data source(s)	Frequency of collection
Literacy	Proportion of children in Year 3 achieving at or above the national minimum standards for reading	Ministerial Council for Education, Early Childhood Development, and Youth Affairs National Assessment Program—Literacy and Numeracy	Annual
Numeracy	Proportion of children in Year 3 achieving at or above the national minimum standards for numeracy	Ministerial Council for Education, Early Childhood Development, and Youth Affairs National Assessment Program—Literacy and Numeracy	Annual
School engagement	Indicator to be developed[(b)]	To be determined	
Outcome 6: Families are confident and have the capabilities to support their children's development			
Family social network	Proportion of children aged 0–12 years whose parent or guardian was usually able to get help when needed[(a)]	To be determined	
Parenting quality/capacity	Indicator to be developed[(b)]	To be determined	
Outcome 7: Quality early childhood development services that support the workforce participation choices of families			
Quality of early childhood education and care services	Proportion of early childhood education and care services that meet the National Quality Standard[(a)]	National Quality Standard and rating system (from 2014)	Annual
Accessibility of early childhood education and care services	Unmet need for early childhood education and care services	Australian Bureau of Statistics Survey of Childhood Education and Care	3 yearly

(a) Data not currently available or not suitable for reporting.
(b) Further development to the indicator needed before data collection and/or reporting.

Note: Shaded rows mean data is available for reporting.

Data development and reporting

Indicators have been defined for 15 of the 20 indicator areas for reporting against the ECD Outcomes Framework. Data are currently available, or will be available for reporting (by 2014), on 13 of these indicators, with data collection methodology and sources to be agreed for a further 2 indicators—social and emotional wellbeing and family social network (Table 4.5). For these two indicators considerable indicator development work has been undertaken, as part of the data development work for the Children's Headline Indicators (AIHW 2010a, AIHW 2011).

Indicators for the remaining 5 areas are not yet developed or defined —child behavioural problems, peer relationships, cultural appropriateness, school engagement, and parenting quality/capacity— and require further work to conceptualise and establish the most important aspects for children's health, development and wellbeing.

Reporting against the ECD Outcomes Framework will, therefore, involve a staged approach, due to the varying levels of indicator and data development.

Table 4.5: Data development and reporting status of indicators for reporting against the ECD Outcomes Framework in the ECD Strategy

Data currently available	Data expected to be available by 2014	No national data source currently available	Considerable indicator and data development required
Birthweight	Breastfeeding	Social and emotional wellbeing	Child behavioural problems
Mortality	Shelter	Family social network	Peer relationships
Overweight and obesity	Preschool and school attendance		Cultural appropriateness
Child abuse and neglect	Quality of early childhood education and care services		School engagement
Early learning			Parenting quality/capacity
Transition to primary school			
Literacy			
Numeracy			
Accessibility of early childhood education and care services			

4.4 Next steps

The recommended set of indicators to measure progress against the ECD Outcomes Framework will be progressed to COAG for endorsement through the Australian and state and territory governments in 2011.

AIHW will provide further information on the technical specifications for each of the indicators outlined in Tables 4.4–4.5 during 2011. This will include information on the operational definitions, primary data sources, proposed disaggregations, and any data issues or limitations associated with the indicators and data sources, in particular inconsistencies between indicator (ideal) definitions and existing data definitions. These specifications will guide the analysis and interpretation of data for the proposed indicators in the ECD Reporting Framework.

Due to the varying levels of indicator and data development discussed in Section 4.3, reporting on the indicators in the ECD Outcomes Framework will involve a reporting stream and data development stream. Further data development work will be required to ensure that all indicators are able to be populated with valid data.

Appendix 1: Ecological model

Bronfenbrenner's ecological model

Bronfenbrenner's (1979, 1995) ecological theory describes interactions between children and their environment, and provides a detailed picture of contextual influences and their interactions with the individual (Figure A1.1). This framework is based on an ecological model of human development, in which individual development occurs within concentric circles of environmental influence, which include family, school, peer, neighbourhood, community and nation.

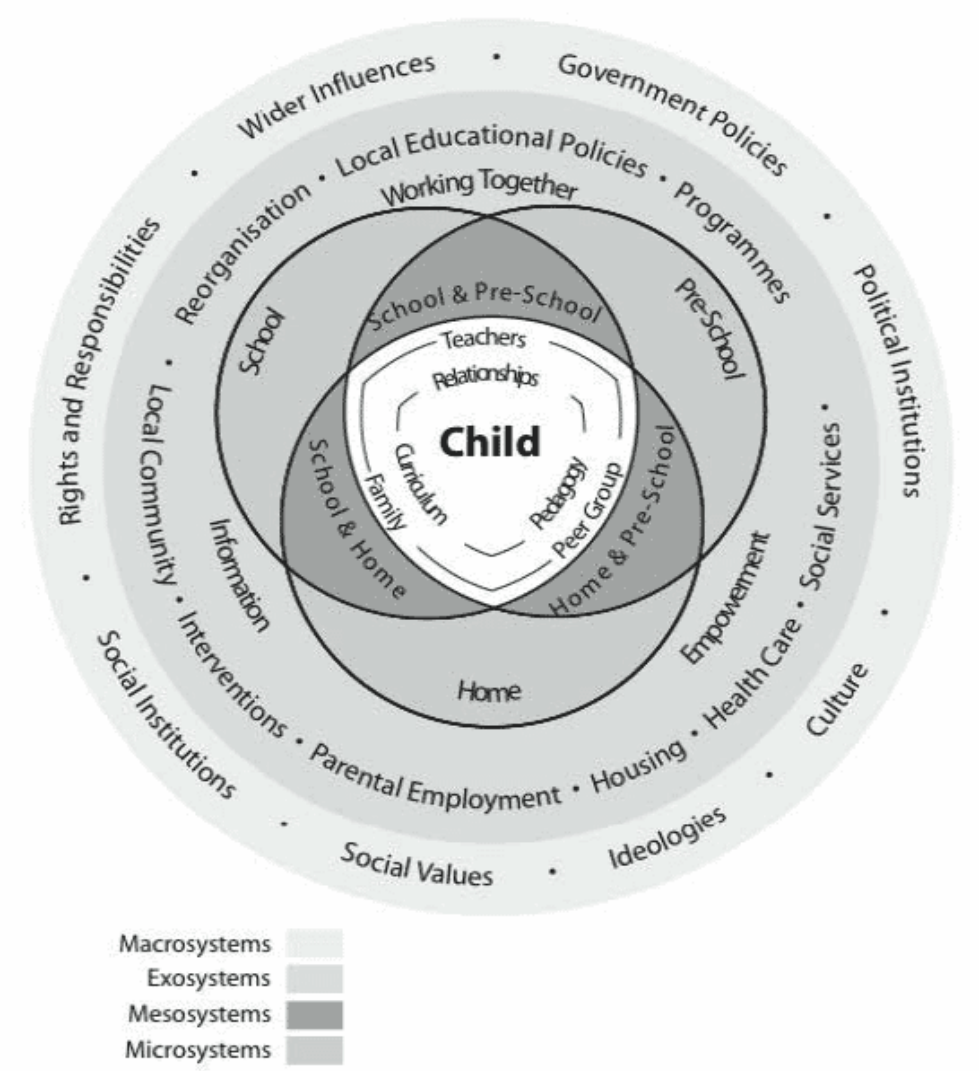
The basic unit (microsystem) in Bronfenbrenner's model is formed by the network of interactions in any one setting (family, school, neighbourhood) where the child interacts directly with people and activities. Interactions among two or more microsystems (such as family and school) constitute a mesosystem. Beyond this structure is the exosystem, which contains settings where the child is not directly involved but which influence, or are influenced by, a setting where the child is directly involved. For example, the parents' work place, their groups of friends, and government social services are all settings that indirectly influence the child through their interactions with the child's family.

These three sets of ecological structures described (microsystems, mesosystems, and exosystems) constitute a child's immediate developmental context. Such contexts differ in significant ways both between and within countries, because of differences in economies, culture, race/ethnicity, religion, beliefs, lifestyles, and other factors. In Bronfenbrenner's model, the cultures, subcultures, beliefs, and ideologies that envelop and influence children's immediate developmental context constitute a macrosystem.

More recently, this ecological model has evolved to recognise that the process of interaction between the individual and the environment will vary with time, both within an individual's life course and historical times, in which the processes take place (chronosystem).

An ecological approach

Children and their environments interact continually in the developmental process. This affects all areas of a child's development: physical, cognitive, psychological and social (Lippman et al. 2009). In recognition of this, there has been a move towards broadening reporting frameworks for children to take into account the influences of family, and the wider social, community and economic contexts in which children are growing up, following an ecological approach (AIHW 2008b). As discussed in Section 2.1, and as evident from Table A2.1, the ecological approach was the most widely used approach in the frameworks reviewed (9 of the 29 frameworks reviewed), particularly in the Australian context, with Bronfenbrenner's ecological theory widely cited.



Source: Dunlop 2002.

Figure A1.1: An example of an ecological model

Frameworks based on an ecological approach

Of the 9 frameworks based on an ecological approach, the *Victorian Child and Adolescent Outcomes Framework* and the *Progress of Canadian children and youth* framework developed a pictorial representation of the conceptual model adopted using an ecological approach (figures A1.2 and A1.3). These conceptual models were used to guide indicator selection for these frameworks, and also as organisational frameworks for the indicators.

The *Victorian Child and Adolescent Outcomes Framework* has been designed to reflect the ecology of childhood according to Bronfenbrenner's model, acknowledging the systems (micro, meso, macro) or environments that influence child outcomes. The child is at the centre of the framework, surrounded by their family, the community that supports families, and the societal factors that enable communities and families to support children (Figure A1.2). A key advantage of this framework, in terms of developing national outcome measures for early childhood development, is its focus on outcomes. These outcomes were

based on a review of the evidence on factors known to make a difference for children and young people.

The *Progress of Canadian children and youth* framework addresses two categories of indicators: environmental/context (input) indicators, which represent the developmental influences affecting child development; and progress (output) indicators, which are general measures of how children are faring, in recognition that the wellbeing of children depends heavily on the environments in which they live (Figure A1.3).

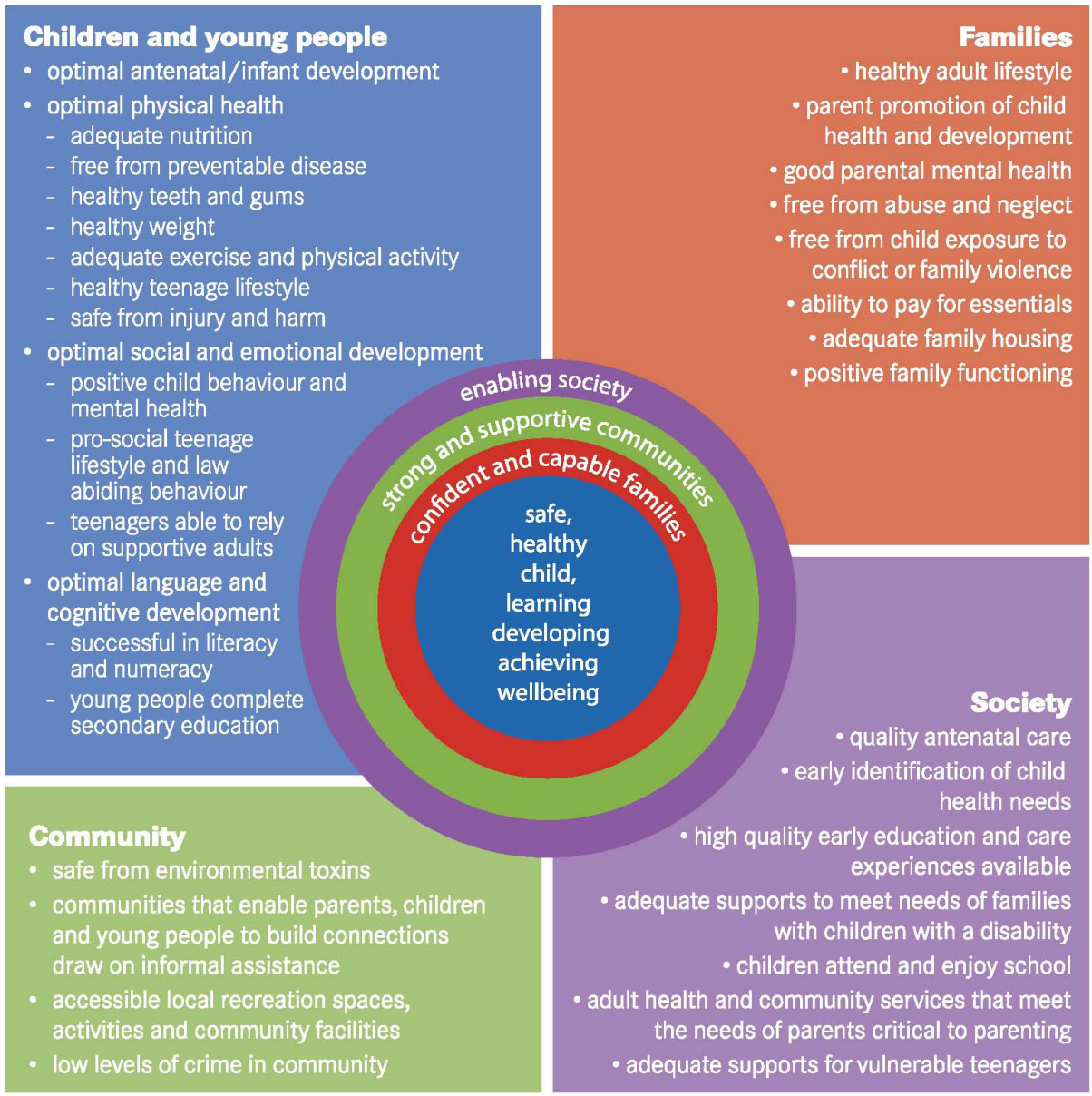
Positive indicators of child wellbeing also proposes a conceptual model, but as this framework is under development and has not yet been used for reporting, it is unknown whether this is also proposed to be the organisational framework, although this is likely.

The Longitudinal Study of Australian Children Framework, within the ecological model, takes a developmental pathways approach with an emphasis on trajectories. The study follows two cohorts of children—infants aged 3–19 months and children aged about 4–5 years at Wave 1 (2004)—with data collected every 2 years. Data from waves 1–3.5 are currently available, enabling the longitudinal nature of this study to be used. A key benefit of this type of longitudinal study is to investigate how children's developmental outcomes are interlinked with their environment. This study is expected to be useful for research into both short-term and longer-term outcomes of early childhood development.

The *Key national indicators of children's health, development and wellbeing* and the *Headline Indicators for children's health, development and wellbeing*, while taking an ecological approach to finding priority areas and indicators, did not develop an organisational framework around an ecological model. The organisational framework for the *Key national indicators of children's health, development and wellbeing* originally consisted of three broad groups of indicators of child health, reflecting the initial health focus of these reports: health status, risk and protective factors, and the delivery of health services and interventions. The framework was endorsed by an AIHW advisory committee, discussed at a workshop convened by the AIHW in 1998, and subsequently endorsed by the Australian Health Ministers' Advisory Council (AIHW 2005). Since that time, the organisational framework has been broadened from being largely health-focused, to taking an ecological approach to child development to take a whole-of-child approach to wellbeing. These developments to the organisational framework occurred through consultation with the National Child Information Advisory Group. The *Headline Indicators for children's health, development and wellbeing* used the draft *National Agenda for Early Childhood* as an organisational framework. The indicators were grouped into four domains: healthy families and young children, early learning and care, supporting families, and creating child-friendly communities (Vic DHS 2008).

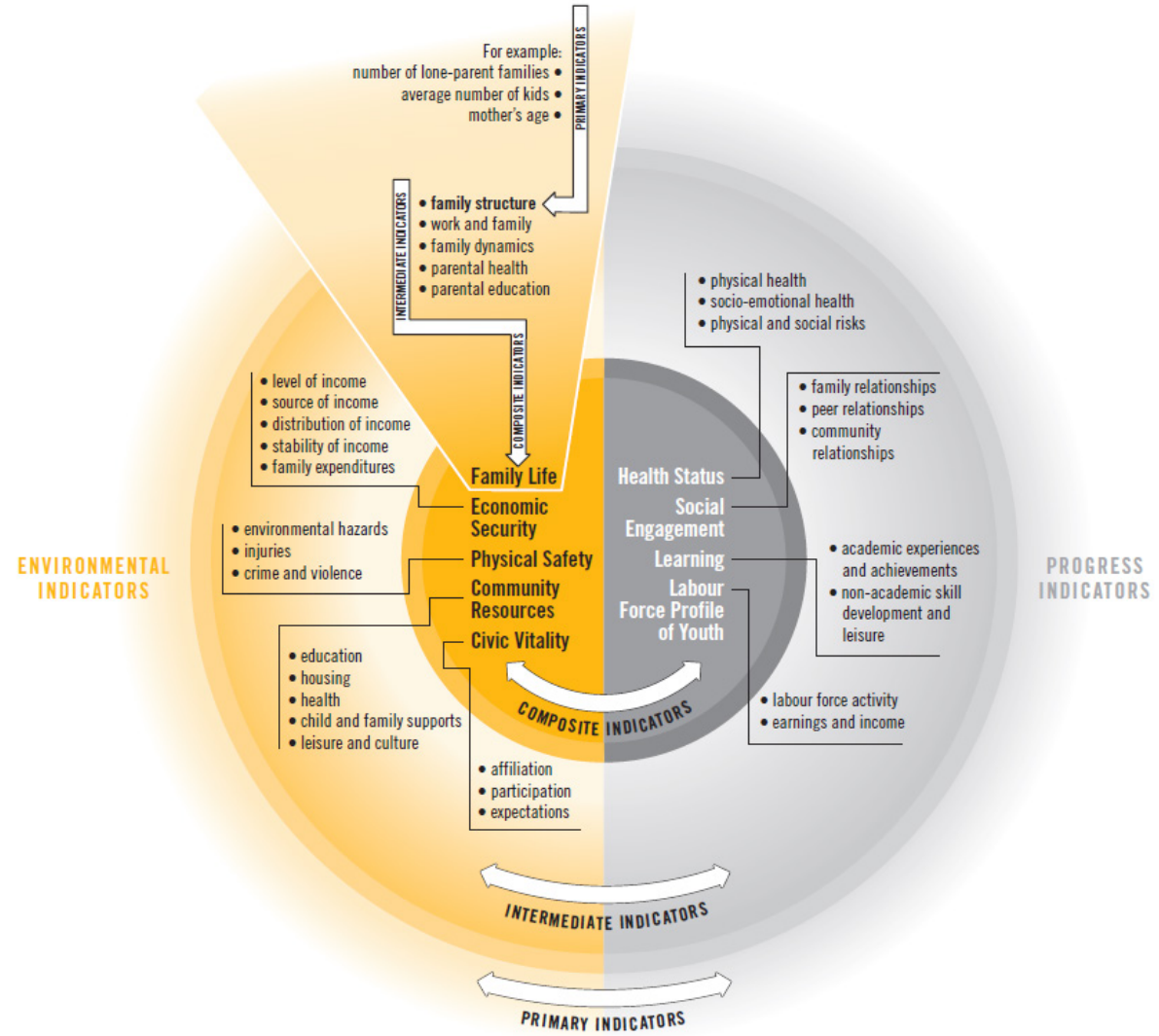
The *Indicators of social and family functioning* framework was based on an ecological view of child development, and within this a 'causal pathway' approach; however, the conceptual approach was developed further by adopting a broad theoretical framework to measure indicators of social and family functioning, as developed by Brooks-Gunn (1995) and earlier work (Coleman 1988; Haverman & Wolfe 1991, 1994). This framework takes as its point of reference those family and social 'resources' to which children, in theory, have access, and which are relevant to developmental outcomes. Five major categories of resources might be mobilised on behalf of children: income, time, human capital, psychological capital, and social capital. This framework, while focused on contextual indicators relevant to child outcomes, does not adequately capture the actual child outcomes (individual factors), so is not considered suitable as a theoretical framework for early childhood development outcomes.

The remaining frameworks, *Indicators for child health and development and wellbeing* and *Indicators of child, family and community connections* while based on an ecological approach, did not further develop conceptual models or specify a reporting framework, and have not been used for reporting as an indicator set to date.



Source: Victorian Department of Education and Early Childhood Development 2009.

Figure A1.2: Victorian Child and Adolescent Outcomes Framework



Source: Canadian Council on Social Development 2006.

Figure A1.3: Progress of Canada's children and youth framework

Appendix 2: Overview of early childhood development frameworks

Table A2.1 contains information on the 61 frameworks, reports, national agreements, reporting tools and instruments (hereafter referred to as 'frameworks') that were found to be related to, or have elements related to, early childhood development. The process for considering their relevance to early childhood development, such as scope and purpose of the framework, and the age range covered are also included in Table A2.1.

The frameworks included Australian (33 frameworks), international (12) and multinational (7) frameworks, as well as discipline frameworks (9) in the areas of developmental psychology, positive psychology, sociology and social context, education and school. Many of these frameworks were found in the report published by the UNICEF Innocenti Research Centre, *Positive indicators of child well-being: a conceptual framework, measures and methodological issues* (Lippman et al. 2009).

The frameworks that are broad in scope and aiming to provide a comprehensive picture of children's health, development and wellbeing are shaded in Table A2.1. These 29 frameworks are discussed in detail in Section 2.1, and are the most relevant in establishing key elements in a reporting framework for early childhood development.

Table A2.1: Frameworks relevant to early childhood development

Framework		Comments
	Australian	
1.	Key national indicators of children's health, development and wellbeing *(A picture of Australia's children 2009)*	Reporting framework, indicator-based Ecological approach Coverage: 0–14 years
2.	Headline Indicators for children's health, development and wellbeing	Reporting framework, indicator-based Ecological approach Coverage: 0–12 years
3.	Australian Research Alliance for Children and Youth Report card: the wellbeing of young Australians 2008	Reporting framework, indicator-based Based on UN Convention on the Rights of the Child, which sets internationally comparable standards, but does not provide coverage across all of the domains Coverage: 0–25 years
4.	Victorian Child and Adolescent Outcomes Framework	Reporting framework, indicator-based Ecological approach Coverage: 0–18 years
5.	Tasmania Kids Come First Outcomes Framework	Reporting framework, indicator-based (based on Victorian Child and Adolescent Outcomes Framework) Ecological approach Coverage: 0–17 years
6.	Looking out for young South Australians	Reporting framework, indicator-based Based on UK Every Child Matters Outcomes Framework Coverage: Less than 18 years

(continued)

Table A2.1 (continued): Frameworks relevant to early childhood development

Framework		Comments
7.	Families NSW Outcome Framework	Reporting framework, indicator-based Emphasis on the domain of child physical well-being Coverage: 0–8 years
8.	Indicators for child health and development and wellbeing	Reporting framework, indicator-based Ecological approach Coverage: Age not defined, but focus is on 0–8 years
9.	Australian Early Development Index	Development/assessment framework (includes domains) Based on the child and does not capture contextual factors such as family and community Coverage: Age at school entry
10.	Longitudinal Study of Australian Children framework	Research framework Ecological approach Coverage: 2 cohorts: 0–1 year and 4–5 years
11.	National Framework for Protecting Australia's Children	Policy framework, includes indicators Scope limited to child protection and early intervention, but framework promotes the importance of early intervention and prevention, with a focus on sharing responsibility for keeping children safe and well across the community Coverage: 0–17 years
12.	Early Years Learning Framework for Australia	Policy framework Scope limited to guiding delivery of early childhood learning and care Coverage: 0–5 years
13.	National Quality Standard for Early Childhood Education and Care and School Age Care	Policy framework Scope limited to quality standards for early childhood education and care and school age care Coverage: 0–school age
14.	Social Inclusion Policy Design and Delivery Toolkit	Policy framework Designed for use in development of policy and by service providers Coverage: Not applicable
15.	National Health Performance Framework	Performance framework, indicator-based Captures all domains except for family/peers, but does not capture early childhood developmental aspects, such as social and emotional wellbeing and early childhood education and care Coverage: All ages
16.	Aboriginal and Torres Strait Islander health performance framework (based on the National Health Performance Framework)	Performance framework, indicator-based (based on National Health Performance Framework) Coverage: All ages
17.	Overcoming Indigenous disadvantage	Performance framework, indicator-based Scope limited to population sub-group Coverage: All ages
18.	Report on Government Services	Performance/policy framework, includes indicators Framework is outcome oriented and indicators are system/service focused Coverage: All ages
19.	National Healthcare Agreement	Performance/policy framework, includes indicators Framework is limited to the organisation of health performance indicators Coverage: All ages

(continued)

Table A2.1 (continued): Frameworks relevant to early childhood development

Framework		Comments
20.	National Indigenous Reform Agreement	Performance/policy framework, includes indicators Framework is limited to measuring progress against the COAG Closing the Gap targets Coverage: All ages
21.	National Partnership Agreement on Indigenous Early Childhood Development	Performance/policy framework, includes indicators Framework is limited to measuring progress against the outcomes in the agreement Coverage: 0–8 years
22.	National Partnership Agreement on Early Childhood Education	Performance/policy framework, includes indicators Scope limited to early childhood education (that is, learning) Coverage: 0–8 years
23.	National Education Agreement	Performance/policy framework, includes indicators Scope limited to education Coverage: 0–24 years
24.	National Disability Agreement	Performance/policy framework, includes indicators Scope limited to disability Coverage: All ages
25.	National Affordable Housing Agreement	Performance/policy framework, includes indicators Scope limited to housing Coverage: All ages
26.	National Partnership Agreement on Homelessness	Performance/policy framework, includes indicators Scope limited to homelessness Coverage: 0–24 years
27.	National Partnership Agreement on Low Socio-Economic Status School Communities	Performance/policy framework, includes indicators Scope limited to school communities Coverage: School age–24 years
28.	National Partnership Agreement on Literacy and Numeracy	Performance/policy framework, includes indicators Scope limited to literacy and numeracy Coverage: School age
29.	National Partnership Agreement on Preventive Health	Performance/policy framework, includes indicators Scope limited to health Coverage: All ages
30.	National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes	Performance/policy framework, includes indicators Scope limited to health for a population sub-group Coverage: All ages
31.	National Partnership Agreement on Essential Vaccines	Performance/policy framework, includes indicators identified for information only, and may be used to monitor the achievement of objectives and outcomes for immunisation under the National Healthcare Agreement Scope limited to essential vaccines Coverage: Children under 5 years, adolescents, 65 year olds

(continued)

Table A2.1 (continued): Frameworks relevant to early childhood development

Framework		Comments
32.	SA-NT DataLink	Not a framework Project to link datasets in SA and NT with a focus on gaining an understanding of the influences on children's development Coverage: All ages, focus on children
33.	Overview of children's understandings of wellbeing	Not a framework Identifies themes according to a study in New South Wales found to make up children's wellbeing Coverage: 8–15 years
	International	
34.	America's children: key national indicators of wellbeing 2009	Reporting framework, indicator-based Limited indicators in psychological and social wellbeing/ development; does not capture community and social contextual factors, but acknowledges the need for future indicator development Coverage: 0–17 years
35.	Child Trends DataBank (USA)	Reporting framework, indicator-based Framework and indicators under revision Coverage: 0–17 years
36.	Children and young people: indicators of wellbeing in New Zealand	Reporting framework, indicator-based Scope limited to social wellbeing, with no indicators on family/ relationships or other contextual factors Coverage: 0–17 years
37.	Progress of Canadian children and youth 2006	Reporting framework, indicator based Ecological approach Coverage: 0–24 years
38.	Wellbeing of Canada's young children	Reporting framework, indicator based Based on government priorities; insufficient information on the theoretical approach used Coverage: 0–5 years
39.	State of the nation's children (Ireland)	Reporting framework, indicator based Limited coverage across domains Coverage: 0–17 years
40.	System of key indicators of infancy and adolescence (Spain/Catalonia)	Reporting framework, indicator based Limited coverage across domains Coverage: 0–17 years
41.	Statistics on children in South Africa	Reporting framework, indicator based Limited coverage across domains Coverage: 0–17 years
42.	Child wellbeing indicators (Italy)	Reporting framework, indicator based (under development) Based on UN Convention on the Rights of the Child, which sets internationally comparable standards, but does not provide coverage across all of the domains Coverage: Children—not further defined
43.	Every Child Matters Outcomes Framework (UK)	Reporting framework, indicator based Based on government priorities Coverage: 0–19 years

(continued)

Table A2.1 (continued): Frameworks relevant to early childhood development

Framework		Comments
44.	New Performance Framework for Local Authorities and Local Authority Partnerships (UK) (includes all indicators in the Every Child Matters Outcomes Framework (UK))	Performance framework, indicator-based A broad framework of which one component is the Every Child Matters Outcomes Framework (UK) Coverage: All ages, focus on children 0–19 years
45.	Kids Count (USA)	Not a framework, indicator-based Report on 10 core indicators related to physical and socioeconomic factors Coverage: 0–19 years
	Multinational	
46.	Multi-national Project for Monitoring and Measuring Children's Well-being	Reporting framework, indicator-based Insufficient information on the theoretical approach used; indicators not fully defined Coverage: Children—not further defined
47.	Organisation for Economic Co-operation and Development: Doing better for children	Reporting framework, indicator-based Based on UN Convention on the Rights of the Child, which sets internationally comparable standards, but does not provide coverage across all of the domains Coverage: 0–19 years
48.	UNICEF: Child poverty in perspective: an overview of child well-being in rich countries	Reporting framework, indicator-based Based on UN Convention on the Rights of the Child, that sets internationally comparable standards, however does not provide coverage across all of the domains Coverage: 0–17 years
49.	Child health indicators of life and development	Reporting framework, indicator-based Based on the European Community Health Indictors with changes for children and youth; highlights several areas for indicator development Coverage: 0–17 years
50.	Total Environment Assessment Model for Early Childhood Development	Assessment framework, ecological approach A framework for understanding the environments (and their characteristics) that play a significant role in providing nurturing conditions to all children equitably Coverage: 0–8 years
51.	Innocenti Social Monitor	Not a framework, includes indicators Reports on data to establish critical economic and social trends, and to assess the impact of policies on children Coverage: 0–19 years
52.	UN Convention on the Rights of the Child	Not a framework Used as the basis for many frameworks, but not a framework in itself Coverage: 0–17 years
	Discipline	
53.	Early childhood development in social context	Reporting framework, indicator-based Based on a model of early childhood development used in the school readiness field Coverage: 0–5 years

(continued)

Table A2.1 (continued): Frameworks relevant to early childhood development

Framework		Comment
54.	Indicators of child, family and community connections	Reporting framework, indicator-based Ecological approach Coverage: Focus is 0–17 years
55.	Indicators of social and family functioning	Reporting framework, indicator-based Ecological approach Coverage: Children—not further defined
56.	Positive indicators of child wellbeing	Reporting framework, indicator-based (under development) Ecological approach Coverage: 0–17 years
57.	America's Promise Alliance	Assessment framework, indicator-based Developed as an assessment tool; focuses on contextual/environmental factors Coverage: 0–17 years (focus on 12–17 years)
58.	Developmental assets for early childhood and children	Assessment framework Developmental framework with a strong focus on contextual factors, such as family relationships and the neighbourhood and school environment Coverage: 3–9 years
59.	Elementary school success profile (ESSP) dimensions	Assessment framework Developed as an assessment tool to assess risk and protective factors known to be associated with adolescent behaviour problems Coverage: Students Grades 3–5
60.	Conceptualising and measuring indicators of positive development	Not a framework Implied framework, but does no specify indicators or measures Coverage: Not specified
61.	What are good child outcomes?	Not a framework Considers good child outcomes from the perspectives of developmental psychology, economics and sociology Coverage: 0–17 years

Note: The shaded frameworks are broadest in scope and most appropriate for a reporting framework for early childhood development. These 29 frameworks are discussed in detail in Section 2.1.

Appendix 3: Literature review summaries

An extensive review of national and international literature was done to establish aspects of early childhood development that were most strongly associated with child health, development and wellbeing outcomes. This appendix provides a brief overview of the research and literature that supports the importance of these key areas to early childhood development outcomes. The summary of this literature review has been mapped to the *outcomes* framework, which provides the organisational framework for reporting on early childhood development.

Outcome 1: Children are born and remain healthy

Antenatal care

Antenatal care is critical in improving birth outcomes. Improving the access to and the quality of antenatal care can avert many poor maternal and child outcomes, such as maternal mortality, stillbirth and other perinatal deaths. Antenatal care can act as a mechanism to improve maternal nutrition, reduce exposure to harmful risk factors and infections, screen for and treat risk factors, manage maternal health conditions, and encourage parents to choose to have skilled professionals present at the birth. In particular, there is strong evidence antenatal programs can help control maternal infection and medical disorders—for example, to diagnose gestational diabetes and manage diabetes in pregnancy to minimise poor outcomes (Bhutta et al. 2009; Downe et al. 2009; Kapoor et al. 2007; Menezes et al. 2009; Panaretto et al. 2007; Richardus et al. 2003).

In Australia and other developed countries, 20% of maternal deaths are still attributable to lack of antenatal care. These women often come from marginalised groups and areas of relative deprivation, and various socioeconomic factors—such as high parity, low income, minority ethnicity, low educational level, and young age—are associated with late, infrequent, or nonattendance at antenatal sessions in developed countries. Barriers to initial accessing of antenatal care include a late recognition of pregnancy, and barriers to continuing access include personal resources such as finances, time, and social support, and service-related issues such as distance, cost, perceived quality of care, trustworthiness, and cultural sensitivity of staff (Bhutta et al. 2009; Downe et al. 2009).

Smoking in pregnancy

One of the most well-established pregnancy risk factors for adverse birth and long-term outcomes for the child is exposure to antenatal cigarette smoke. Smoking in pregnancy, or exposure to passive smoke, restricts blood flow and oxygen availability to the fetus, increasing the risk of placental problems, miscarriage, preterm delivery, low birthweight, stillbirth, and infant mortality, particularly from sudden infant death syndrome. There is evidence that the more cigarettes a mother smokes, the higher the risk of poor birth outcomes (Aliyu et al. 2007; Chan & Sullivan 2008; Hoff et al. 2007; Jauniaux & Burton 2007; Key et al. 2007; Salihu & Wilson 2007; Triche & Hossain 2007).

Antenatal tobacco exposure can also have long-term health effects on the child, including an increased risk of: childhood cancers; high blood pressure (Kyrklund-Blomberg et al. 2006);

overweight and obesity; Type 2 diabetes; and respiratory symptoms and lung function abnormalities, including wheezing, asthma, and reduced airway function (Jauniaux & Burton 2007; Mamun et al. 2006; Milner et al. 2007; Ng & Zelikoff 2006).

Antenatal active or passive smoking may also have long-term cognitive effects. Smoking in pregnancy impairs speech-processing speed and ability in infants, leading to lower verbal and language scores, and is associated with decreased cognitive abilities at age 4, including verbal, quantitative, executive functioning, and working memory. It has also been associated with increased behavioural problems in children and is one of the risk factors for attention-deficit/hyperactivity disorder (Genomics & Genetics Weekly editors 2007; Julvez et al. 2007; Key et al. 2007).

There is some evidence that giving up smoking before 20 weeks gestation eliminates some of these risks, but other studies show that smoking in any trimester poses a risk. This is still a concern due to the high number of smokers, particularly in at-risk populations such as Aboriginal and Torres Strait Islander women and teenagers, and the low quitting rate during pregnancy (only 1 in 15 teenagers and 1 in 12 mothers aged 20–34 years) (Chan & Sullivan 2008; Jauniaux & Burton 2007).

Alcohol and drug use during pregnancy

Alcohol exposure in-utero can cause fetal alcohol syndrome in the child, which leads to growth restriction, microcephaly (restricted brain/skull size), and mental retardation. Prenatal alcohol exposure can cause defects in structure and function of the central nervous system, affect growth and morphology, and is also strongly associated with alcohol problems later in life, independent of family context (Baer et al. 2003; OBGYN & Reproduction Week 2008; Petry & Hales 2000).

In-utero drug exposure affects both fetal and later child development, as many drug compounds are able to cross the placenta. Drug use in pregnancy greatly increases the risk of placental insufficiency and intra-uterine growth retardation, intra-uterine death, fetal distress, premature delivery, low birthweight, major medical problems, increased treatment costs, and infant mortality due to sudden infant death syndrome (SIDS). Antenatal use of certain drugs such as cannabinoids have also been shown to impair fetal brain development—cannabis affects the production of fetal neurotransmitters in a way that implies an effect on motor activity, drug-seeking behaviour, pain detection, and other neurological processes in the child. Legal drugs such as anticonvulsants and anticoagulants also cause major developmental abnormalities (Fernández-Ruiz et al. 2004; Huestis & Choo 2002; Petry & Hales 2000).

Substance use remains a problem for child health after birth. Newborns born to drug dependent mothers have been found to experience marked irritability, poor feeding and/or excessive weight loss in the short term. Maternal drug use has also been found to affect development in the longer term. There is a risk of maternal inability to care for the child, due to impairment effects of the drug use, and certain drugs, such as alcohol and cannabinoids, are also secreted in breast milk and continue to impair brain development of breastfed infants after birth. The Australian National Health and Medical Research Council provide evidence related to the risks of alcohol consumption in the *Australian guidelines to reduce health risks from drinking alcohol* (2009) (Fernández-Ruiz et al. 2004; Huestis & Choo 2002; Linares et al. 2006).

Infant and child mortality

Mortality rates and causes of mortality are key indicators of the health of a population. They not only reflect circumstances around the time of death but also provide insight into changes in social and environmental conditions, medical interventions, lifestyles, and trends in underlying risk factors. It is self-evident that to improve infant and child health, infant mortality must be minimised. A child's risk of death is greatest around birth and in the first year of life. Infant mortality rate is a children's headline indicator priority area, and is used internationally as a key measure of population and child health (AIHW 2009c).

Globally, deaths of children aged less than 5 years have reached a record low, falling below 10 million per year in 2006 from almost 13 million in 1990. Much of the progress is a result of the widespread adoption of basic health interventions, such as protecting, promoting and supporting breastfeeding, immunisation against once-common and deadly childhood infectious diseases, and improved nutrition. Australia has also shown significant progress in reducing infant and child deaths, particularly as a result of the work of neonatal intensive care units, increased community awareness of the risk factors for sudden infant death syndrome, and reductions in vaccine-preventable diseases through national childhood immunisation programs (UNICEF Innocenti Research Centre 2009).

Social and economic factors are powerful determinants of infant and child mortality. Recent studies in Australia show that child mortality is strongly associated with indicators of parental disadvantage, such as low income, long duration of income support, teenage motherhood, mother's education, number of siblings, and living in socioeconomically disadvantaged areas. One explanation for these patterns is the strong association between infant mortality and the accessibility and effectiveness of health services for mothers and babies, which is also related to economic status (Freemantle et al. 2006; Yu 2008).

Improvements in both access to quality antenatal health care and maternal health through better nutrition and reduced risk behaviours during pregnancy (such as alcohol and tobacco use), as well as annual health checks for children, may serve to reduce the risk of poor health outcomes among Aboriginal and Torres Strait Islander children (AHMAC 2008; AIHW 2009a; CDC 2007; Drevenstedt et al. 2008).

Birthweight

Birthweight is a key indicator of infant health, and a principal determinant of a baby's chance of survival and good health. For newborns, low birthweight poses a greater risk of long hospitalisation after birth, the need for resuscitation, and death. Low birthweight is a risk factor for neurological and physical disabilities, with the risk of adverse outcomes increasing with decreasing birthweight. Some 70% of high-risk babies admitted to Level III neonatal intensive care units in Australia in 2005 were low birthweight infants. Children with extremely low birthweight (less than 1,000 grams) are more likely to have psychosocial problems, and are at an increased risk of having difficulties at school. Teenagers who had extremely low birthweight have been found to be less likely to achieve well on intellectual measures, particularly arithmetic, than their peers (AIHW: Ford et al. 2003; AIHW: Laws et al. 2007; Saigal 2000).

The health effects of low birthweight are not only restricted to infancy and childhood, but continue into adulthood. Research has found an increased risk of Type 2 diabetes, high blood pressure, metabolic and cardiovascular diseases, and possibly obesity in later life among adults who were low birthweight. Behavioural interventions can be effective in tackling

these disorders, and recognising those at increased risk early in life provide an important opportunity to prevent disease (Hovi et al. 2007; Phillips 2006; Tappy 2006).

A baby may be small due to being born early (pre-term), or may be small for its gestational age (intra-uterine growth restriction). Factors that contribute to low birthweight include age of mother, illness during pregnancy, low socioeconomic status, number of babies previously born, maternal history of spontaneous abortion, harmful behaviours such as smoking or excessive alcohol consumption, poor nutrition during pregnancy, and poor prenatal care. Many of these risk factors are modifiable and susceptible to intervention. The increasing number of infants born to older mothers in Australia, and the disproportionate risk faced by certain population groups, makes birthweight an important indicator of antenatal and neonatal health (AIHW: Laws et al. 2004; AIHW: Laws et al. 2007; Chomitz et al. 1995).

Breastfeeding

Breastfeeding is the normal way to feed infants, and is important in promoting the healthy growth and development of infants and young children. Infants are born with an immune system that is not fully developed, and breastmilk (containing mothers' antibodies) provides the best nutritional start for them, reducing the risk of morbidity and mortality from infectious diseases.

There is a large volume of research on the health benefits of breastfeeding in infancy and childhood, but it has been difficult to establish a causal relationship. There is convincing evidence that breastfeeding protects infants against infectious diseases, including gastrointestinal illness, respiratory tract infections and middle ear infections. Other possible benefits include a reduced risk of sudden infant death syndrome, Type 1 diabetes and some childhood cancers; but further research is required. There is conflicting evidence as to whether breastfeeding has a protective effect against asthma and other allergies in childhood. However, longer duration of breastfeeding has been found to be associated with a reduced risk of wheeze or asthma during infancy. There is some evidence that having been breastfed may reduce the incidence of high cholesterol, high blood pressure, obesity and diabetes later in life, and may improve cognitive development. More exclusive and longer periods of breastfeeding show the strongest associations between breastfeeding, lower rates of infant illnesses and better cognitive development (ACAM 2009; Horta et al. 2007; Kramer et al. 2008).

The World Health Organization and the Australian National Health and Medical Research Council recommend that all infants should be exclusively breastfed up to 6 months of age to achieve optimal growth, development and health. Despite these benefits, less than two-thirds of Australian babies are still being breastfed (either exclusively or partially) at 4 months of age according to the Australian Bureau of Statistics 2004–05 National Health Survey. Most women initiate breastfeeding but many stop after several weeks or months, and the literature suggests various reasons for mothers not initiating or not persisting with breastfeeding. Many women turn to infant formula because they have experienced significant difficulties in breastfeeding, indicating that the availability of professional support can be an important factor in prolonging breastfeeding. Marketing strategies of feeding infants with formula, and a lack of awareness in mothers about the differences between breastmilk and formula are also considered important factors. Paternal, family and community support of breastfeeding, and positive interactions with health professionals are also crucial (AIHW 2009b; Binns et al. 2004; House of Representatives enquiry committee 2007; NHMRC 2003; Renfrew et al. 2005; WHO 2002).

Social factors play a key role. Mothers who choose to initiate and persist in breastfeeding tend to: be older; be better educated; come from upper socioeconomic families; come from two-parent families; did not smoke in pregnancy; and have above average incomes and living standards. Babies born into the most disadvantaged population groups would benefit most from breastfeeding, but are often less likely to be breastfed. This pattern further widens inequality in health outcomes (Binns et al. 2004; Horwood & Fergusson 1998; NHMRC 2003).

Immunisation

A large part of the reduction of mortality and morbidity in children in the past century has been due to the increase in immunisation practice to protect against infectious diseases. Immunisation can protect children against a multitude of communicable diseases, such as measles, mumps, rubella, Haemophilus influenzae type B (Hib, which is one cause of meningitis), rotavirus infectious, and whooping cough. But children who do not receive complete and timely immunisations remain at risk of contracting these illnesses, resulting in short-term and long-term health consequences.

Mortality and disease due to communicable disease has the potential to be considerable, and this is especially true in young children, whose immune systems are still developing. Immunisation protects children against the effects of the disease itself, and also against long-term complications of the disease, which can be even more severe. Timeliness of immunisation is particularly important for infant/early childhood diseases such as pertussis and invasive disease due to Haemophilus influenzae type B or streptococcus pneumoniae, but this is not fully captured by indicators that focus on vaccination coverage by a certain age (Andre et al. 2008; England et al. 2001; Hull & McIntyre 2006; NHMRC 2008; WHO 2005; WHO 2007a).

While there have been public concerns about vaccine safety, countless studies have shown that vaccines are safer than therapeutic medicines, and most vaccine scares have been false alarms (Andre et al. 2008; MacIntyre 2001).

Australian studies using the Australian Childhood Immunisation Register and other sources have shown that although coverage has increased over time, it decreases with the age of the child, and timeliness of childhood vaccination has not improved. In particular, Aboriginal or Torres Strait Islander infants and young children under the age of 2 years remain at highest risk of delayed vaccination, which is a major factor contributing to higher disease burdens due to pertussis and Haemophilus influenzae type B. However, Aboriginal and Torres Strait Islander infants have generally 'caught up' to non-Indigenous children in immunisation coverage by the time they reach the age of 2 years. Pneumonia remains the vaccine-preventable disease that contributes most significantly to premature death in Aboriginal and Torres Strait Islander people (Commonwealth of Australia 2006; Commonwealth of Australia 2008a; Commonwealth of Australia 2008b; Hull & McIntyre 2006; Lister et al. 1999; O'Grady et al. 2009).

Developmental checks

Regular child health checks, such as the Medicare Benefits Schedule Healthy Kids Checks are important to prevent disease and assess development in young children, and are crucial to finding health conditions that were either missed in newborn screening, or have manifested since birth. Earlier interventions, allowing earlier treatment, are often associated with better developmental outcomes. For example, screening for speech and language delay in young

children allows professionals to recognise developmental conditions that may affect academic and social outcomes (DoHA 2009a; Nelson et al. 2006; Talen et al. 2007).

Overweight/obesity

Overweight and obesity increases a child's risk of poor physical health, and is a risk factor for morbidity and mortality in adulthood. Obese children have a greater risk of developing asthma and Type 2 diabetes than non-obese children, and in severe cases may develop conditions such as gallstones, hepatitis and sleep apnoea. Children who continue to be overweight or obese into adulthood are at increased risk of coronary heart disease, diabetes, certain cancers, gall bladder disease, osteoarthritis and endocrine disorders (Guo et al. 2002; Must & Strauss 1999; Whitlock et al. 2005).

Childhood obesity shows very strong associations with obesity in the parents, particularly in the same-sex parent. Other factors that contribute to obesity in childhood include smoking in pregnancy, poor intra-uterine nutrition, low birthweight, absence of breastfeeding, timing of maturation, and time spent watching television (DoHA 2009b; Ludwig & Gortmaker 2004; Perez-Pastor et al. 2009; von Kries et al. 2002).

As well as having physical health problems, overweight and obese children often experience discrimination, victimisation and teasing by their peers. This may contribute to poor peer relationships, school experiences and psychological wellbeing, particularly among older overweight or obese children. Children affected by overweight and obesity are also more likely to come from disadvantaged backgrounds or minority population groups such as Indigenous, Pacific Islander and Middle Eastern communities (Griffiths et al. 2006; Hayden-Wade et al. 2005; O'Dea 2008; Sawyer et al. 2006).

Many interacting factors lead to increased body weight. All children naturally gain body weight as they grow and develop; however, for excess weight gain to occur, there must be an imbalance between the amount of energy children are consuming and the energy they expend over an extended period of time. While genetics may play an intervening role, it is clear that cultural, environmental, economic, familial and individual behavioural factors also influence the likelihood of this imbalance occurring (AIHW 2009b).

Early childhood is an ideal period for intervention, particularly as childhood obesity is closely linked to food preferences and dietary habits, which are firmly established in the early years of life. Family environment and parental behaviour in early feeding practices have a strong modifying effect on children's eating behaviour, and therefore on patterns of childhood obesity (Benton 2004; Daniels et al. 2009).

Nutrition

Good nutrition is important in supporting the rapid growth and development that occurs during childhood. Children's eating choices are shaped by individual preferences, as well as cultural and family influences. For young children, diet is largely determined by their parents, although children take greater responsibility for their own food choices as they grow older. So it is important to establish healthy eating patterns at a young age (AIHW 2009b).

Regular physical activity and good nutrition reduces cardiovascular risk in its own right, and also: improves levels of cardiovascular risk factors such as overweight, high blood pressure and Type 2 diabetes; protects against some forms of cancer; and strengthens the musculoskeletal system (AIHW 2009b; NHMRC 2003).

Physical activity and nutrition are critical factors in determining a person's body weight. If energy intake (via food and drink) is not balanced by energy expenditure (via activity and internal body functions) on a sustained basis, the excess food energy is stored as body fat. Physical inactivity and poor nutrition may be important contributors to the rising levels of obesity in the general population.

Maternal nutrition during pregnancy is also critical for brain and early childhood development. Nutrition from the mother provides the essential building blocks for intra-uterine growth, and deficiencies transmitted to the fetus can impair learning and later development. For example, a diet that is very poor in fatty acids and iodine will not be able to provide the fetus with the elements essential for physical and brain development, resulting in reduced visual function, behavioural abnormalities, cognitive, intellectual and other disabilities (Grantham-McGregor et al. 2007; Haddow et al. 1999; Pollitt et al. 1997).

Physical activity

Regular physical activity is necessary for healthy growth and development in children. Inadequate physical activity can adversely affect many aspects of a child's health, including musculoskeletal development, cardiovascular health, and psychological wellbeing. Children who have low levels of physical activity are more likely to have high blood pressure, high cholesterol, and insulin resistance/diabetes, and are more likely to be overweight or obese (Andersen et al. 2006; Kohl et al. 2000b).

Physical activity, in combination with diet, is a crucial determinant of body weight. However, the intensity and duration of the activity also affects the development and maintenance of cardiovascular fitness. National guidelines recommend a minimum of 60 minutes, and up to several hours, of moderate to vigorous exercise per day for children aged 5-12 years (DoHA 2004).

Regular exercise also strengthens and increases flexibility in the musculoskeletal system. In young children in particular, physical activity may be important in motor skill development and development of fundamental movement patterns. Physical activity also provides relaxation, and can be an important contributor to psychological health in children—regular exercise decreases depression, stress and anxiety levels, and improves self-esteem, self-confidence, energy levels, ability to sleep and concentration levels (Commonwealth of Australia 2008b; DoHA 2004; Hills et al. 2007; Ortega et al. 2008).

Establishing a regular pattern of physical activity early in life is important for continued health into later childhood and adulthood. Levels of physical activity in children, as in

adults, is determined by various factors, including individual preference, family/cultural influences, and health of the child. Environmental factors also play a role, such as availability of suitable spaces/resources, and good weather (Hills et al. 2007).

Dental health

Good oral health is necessary for many aspects of daily living, and can affect quality of life, social interactions and self-esteem. Common effects of dental disease in children and adults include pain, discomfort, difficulty sleeping, and difficulties in eating which can lead to poor nutrition. Children often also demonstrate problems in behaviour and peer interaction. Poor dental health may restrict school activities or lead to absences, which can negatively affect academic performance (Berg & Coniglio 2006; Low et al. 2000; Petersen 2003; Watt 2005).

The presence of dental caries can adversely affect children's growth, and, if left untreated, facilitates abscess formation, infection, cellulitis and the systemic spread of disease. Studies show that poor oral health may be associated with increased incidence of non-communicable chronic diseases such as obesity, heart disease, cancer, stroke, diabetes, chronic pulmonary obstructive disease and mental illness, due to a set of shared risk conditions (Berg & Coniglio 2006; Low et al. 2000; Petersen 2003; Watt 2005).

Most dental diseases are largely preventable, and although the prevalence of caries in Australian children over the past 20 years has decreased, risk factors associated with diet, hygiene and oral care remain. Diet and nutritional patterns have a clear association with dental health. Children who were breastfed have better oral health than those who were not, and throughout childhood, the most significant risk factor for poor dental health is regular consumption of carbonated drinks or cordials (Hallett & O'Rourke 2003; Kruger et al. 2005; Petersen 2003; Watt 2005).

Early preventive strategies, including parental counselling about diet (such as limiting dietary sugar intake), oral hygiene practices (such as regular flossing and brushing with fluoride toothpaste), appropriate use of fluorides, and avoidance of transmission of bacteria from parents to children, all help to establish practices and behaviours for good oral health (Berg & Coniglio 2006).

Young children are not always getting the dental care they need, and most Australian children do not attend an oral examination until they enrol in School Dental Services at 5 years. Suggested reasons for this are cost of dental services, and lack of access or parental awareness (Kruger et al. 2005).

In Australia and internationally, poor dental health is associated with low socioeconomic status, low income levels, single-parent families, younger mothers, mothers with low education levels, ethnicity other than Caucasian, and living in rural/remote areas. Not all parts of Australia have fluoride in public water supply, which may result in higher dental decay in these areas. Aboriginal and Torres Strait Islander children experience more of the risk factors for dental decay, and have twice as much untreated decay. The socioeconomic association with oral health is likely to be due to factors such as education, lack of access to oral care services, and food choice and availability (Gilbert et al. 2003: Hallett & O Rourke 2003; Kruger et al. 2005; Roberts-Thomson et al. 2008; Watt 2005).

Chronic conditions

Chronic conditions such as asthma, cancer, juvenile rheumatoid arthritis, congenital heart disease, cystic fibrosis and Type 1 diabetes in young children can affect normal growth and development processes, and represent a significant barrier to progressing to healthy later childhood and adolescence.

Chronic conditions in children remain a health concern in Australia, as available information indicates up to 41% of Australian children are affected by at least one long-term condition, and prevalence may continue to rise due to continuing medical improvements in the management of life-threatening childhood diseases. While hospitalisations and doctors' visits due to asthma have been declining, and paediatric cancer survival rates are still improving, Type 1 diabetes is becoming increasingly common (ABS 2006b; AIHW 2009c; Chong et al. 2007; Fourlanos et al. 2008; Gale 2002; McGregor et al. 2007; Poulos et al. 2005; van der Lee et al. 2007).

Chronic health conditions affect the physical health and development of the child, not only due to the condition, but sometimes to treatment side-effects. However, one of the most common risks of chronic conditions in children is reduced psychosocial health (for example, lack of wellbeing, depression and anxiety, poor self-esteem, impaired peer relations) resulting from failure to adjust to the illness. Children with chronic conditions may also have physical complaints, self-concept issues, social and academic difficulties, sleep problems, inability to pursue preferred activities, and eating problems. Children may also be at risk of adverse psychological outcomes, depending on resistance/resilience factors relating to the child, or risk factors relating to the disease. Certain conditions may also increase family/parenting stress, and reduce positive family functioning, which in turn may produce or exacerbate poor psychological outcomes in the children (Eiser 1997; Goodman 2001; McClellan & Cohen 2007; McGregor et al. 2007; Poulos et al. 2005; Roth-Isigkeit et al. 2005; Ziegler et al. 2005).

Chronic conditions require long-term management strategies that incorporate support for self (or family), education, multidisciplinary teams, and efficient clinical information systems. Successful interventions also include education, cognitive-behavioural strategies, social skills training, remediation and rehabilitation, family therapy, and group work (Bodenheimer et al. 2002; Goodman 2001).

Mental health

Mental health is a state of wellbeing in which individuals can realise their abilities, cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their community. Conversely, mental health problems can affect perceptions, emotions, behaviour and social wellbeing. Mental disorders, as distinct from mental health problems, are characterised by a clinically recognisable set of symptoms or behaviours that interfere substantially with social, academic or occupational functioning (APA 1994; Sawyer et al. 2000; WHO 2001).

Children with mental health problems experience several adverse outcomes, including general suffering, functional impairment, exposure to stigma and discrimination, and increased risk of premature death. Various developmental factors contribute to the onset of mental illness in children, including prenatal brain damage, genetic factors, low intelligence, difficult temperament, poor social skills, and low self-esteem. Other contributing factors

include those within the school context, such as: bullying and failure to achieve academically; physical or psychological trauma, such as sustaining injuries, experiencing abuse or neglect, or loss of family; and community and cultural factors, such as low socioeconomic status or discrimination (DHAC 2000; Patel et al. 2007).

Parenting and family factors that can also increase the risk of mental health problems in children include: lack of a warm, positive relationship with parents; insecure attachment between carers and infants; harsh, inflexible or inconsistent discipline; inadequate supervision of, and involvement with children; marital conflict and breakdown; and parental psychopathology (particularly maternal depression and high levels of parenting stress). These factors increase the risk of children developing major behavioural and emotional problems, including conduct problems, substance misuse, antisocial behaviour and participation in delinquent activities (Sanders 2002).

Mental disorders may first manifest in childhood and adolescence, and many disorders diagnosed in adulthood have their origins in childhood. 'Impulse-control' disorders have the earliest typical age of onset at 7–9 years for attention deficit/hyperactivity disorder, 9–14 years for conduct disorder, and 7–14 years for some anxiety disorders (phobias and separation anxiety disorder). These conditions have implications for a child's psychosocial growth and development, health-care requirements, educational and occupational attainment, and involvement with the justice system (Bhatia & Bhatia 2007; Kessler et al. 2007; Laurel & Wolraich 2007).

Preventable hospitalisations

Potentially preventable hospitalisations serve as an indicator of the availability and effectiveness of ambulatory care services—high rates indicate barriers to accessing primary health-care services. This is important, as greater access to ambulatory care results in lower rates of mortality and morbidity, while allowing more efficient use of resources allocated to health care (Bodenheimer et al. 2002).

Potentially preventable hospitalisations are those for which hospitalisation could have been avoided through preventative care and early disease management, usually in the ambulatory care setting, such as primary care settings (general practice and community health services). These hospitalisations may be avoided if clinicians effectively diagnose, treat, and educate patients, and if patients actively participate in their care and adopt healthy lifestyle behaviours (CEHSEU 2009).

Potentially preventable hospitalisations are grouped into three categories: vaccine preventable conditions, including influenza, bacterial pneumonia, tetanus, measles, mumps, rubella, pertussis and polio; selected acute conditions, including dehydration/ gastroenteritis, kidney infection' ear, nose and throat infections, and dental conditions; and chronic conditions, including diabetes and asthma (NHPC 2004).

Outcome 2: Children's environments are nurturing, culturally appropriate and safe

Peer relationships

Young children exhibiting good social skills are able to successfully enter peer groups, effectively resolve conflicts, and maintain play, thereby building strong and enduring peer relationships. Positive peer support has a wide range of benefits for a developing child. Most importantly, warm and strong peer relationships result in emotional stability and reduced behavioural disorders, and ultimately plays a large role in determining wellbeing and good mental health. Peer support also has a protective effect against health risk behaviours (Denham 2007; Denham et al. 2003; Guralnick 2010; Springer et al. 2006).

In some cases, however, deliberate acts that cause physical, psychological and/or emotional harm occurs in interactions between children. There is currently no agreed definition in Australia for bullying, but the most commonly cited definition is the 'repeated oppression, psychological or physical harm, of a less powerful person by a more powerful person or group of persons'. Bullying can either be direct (for example, hitting and teasing) or indirect/covert (for example, spreading gossip, deliberately excluding or enforcing social isolation, and sending malicious text messages). Bullying often occurs because of differences between the bullies and the victims, such as culture, ethnicity, age, ability or disability, religion, body size and physical appearance, personality, sexual orientation, and economic status (DEST 2006, 2007; Rigby 2009).

Bullying in Australian schools is widely recognised as a problem, with more than 20% of males and 15% of females aged 8 to 18 years reporting being bullied at least once a week (Rigby & Slee 1999).

The negative consequences of school bullying include higher absenteeism in children who are bullied, lower academic achievement and consequent lower vocational and social achievement, physical symptoms, anxiety, social dysfunction, depression, school failure, and alcohol and substance use (Lodge 2008; Spector & Kelly 2006).

Shelter

A child's access to stable, adequate, shelter is recognised as a basic human need. Having adequate housing enables people and children to engage with the wider community—socially, recreationally, and economically—and can influence both their physical and mental health. The inclusion of shelter as a policy-relevant priority area for Children's Headline Indicators recognises that housing conditions and stability, and their social determinants, have an impact on the health, development and wellbeing of children (Vic DHS 2006).

For children, the home environment, including both physical and social dimensions, provides a sense of identity and security that is fundamental to their development. Shelter is closely linked to the social and emotional aspects of a child's health and wellbeing, and not merely to the structural features of the built environment. This approach is consistent with the view that children's interactions with their immediate environment, and the relationship between children's immediate environments and larger social contexts, are critical to their development (Wise 2003).

Several components of shelter have an impact on child development and wellbeing, including home ownership, affordability, mobility, homelessness, overcrowding, and characteristics of the dwelling. Housing mobility, overcrowding and homelessness are associated with a decrease in children's short-term academic achievement and an increase in social, emotional and behavioral problems. Frequent movements also have a negative long-term impact on educational attainment. Frequent family moves are linked with increased grade repetitions, school suspensions and expulsions and other psychological issues. The magnitude of the effect of frequent moves increases with the addition of other risk factors such as poverty, minority race, single-parent family structure, low levels of parental education, and young maternal age (Colton 1996; Cooper 2001; Leventhal & Newman 2010; Rubin et al. 1996).

Injuries

In many developed countries, unintentional injury is a leading cause of mortality and disability in preschoolers, and declines in prevalence have not kept pace with decreases in mortality and disability from other causes. Death in infants and toddlers due to unintentional injuries commonly results from suffocation, falls, motor vehicle accidents, and drowning. Hospitalisation may also occur from burns and poisoning. Childhood injuries may also occur due to 'intentional' causes, such as abuse and family/community violence, including homicide (Berry et al. 2010; Cripps & Steel, 2006; Garzon 2005; Howard 2006; Schnitzer 2006; WHO 2006).

Preschoolers are more prone to injury than older children, partly due to a natural curiosity, impulsiveness and immature reasoning skills. Certain physiological factors also make injury more likely, such as the absence of fine motor development (and an inability to right themselves once fallen) and having proportionally larger heads compared to their body size (increasing risk of falls, head injury, and drowning). As well as being more common, injury also has a more severe impact in younger children, who suffer greater rates of mortality and disability as a result of an injury than school-aged children. This is due largely to the physical characteristics of young children, such as smaller airways, softer bones, and higher metabolic rates (which lead to more severe and lasting damage being caused by a lack of oxygen) (Berry et al. 2010; Garzon 2005; WHO 2006).

It is often reported that about 90% of childhood injuries are preventable, as many agents of the injury can be controlled. Environment factors that affect unintentional preschooler injury may relate to the neighbourhood (traffic volume, play areas, access to emergency care), the home (unguarded staircases, dim lighting, overcrowding, lead contamination, unsecured chemicals, fire prevention equipment), or the family (parents' work/hobbies, supervision, parenting practices). In Australia, Helps & Pointer (2006) found that children aged 5–9 years were at most risk of hospitalisation due to falls from playground equipment. Cripps & Steel (2006) found that rates of hospitalised poisoning were highest for those aged 2 years, and that the most common place for poisoning to occur in young children was in the home or nearby grounds (Garzon 2005; Howard 2006).

Child head injuries can also affect behavioural and emotional development, and the societal cost of childhood disability following head injury can be substantial. In Australia, Berry et al. (2010) looked at the rates of hospitalisation for head and traumatic brain injury among Australian children aged 0–14 years during 2000–2006. This study found that children living remotely were disproportionately represented among those sustaining head injuries. The higher rates of child head injuries in remote and very remote areas compared with major cities may be explained, to some extent, by the higher proportion of Aboriginal and Torres

Strait Islander people living remotely, and their experience of excess morbidity and mortality from injury compared with other Australians. Boys also had higher rates of head injury and traumatic brain injury than girls (Berry et al. 2010).

Low socioeconomic status is a significant risk factor for unintentional preschooler injury. There is also an increased risk of poor outcome following injury in conditions of social deprivation. In particular, risk of death increases significantly with increasing socioeconomic disadvantage, particularly from injuries relating to falls, suffocation or pedestrian–vehicle collisions (Birken et al. 2006; Garzon 2005; Hawley et al. 2004; Towner 2005; WHO 2006).

Parental substance use

Children of parents who are substance users (alcohol, illicit drugs, or misuse of prescription drugs) are at significantly increased risk of poor health and developmental delays. Parental substance use is an important social concern due to its potential to widen the disadvantage gaps between children of different socioeconomic backgrounds.

The level of substance use in households with dependent children is high, particularly when behaviours such as binge-drinking are considered. Substance abuse affects an individual's daily functioning, including his or her ability to parent and provide nurturing or adequate care for a child. Factors associated with substance abuse can also affect the physical and psychological environment of a family, which is known to significantly affect child health and wellbeing (Dawe et al. 2006).

Parental substance abuse often co-occurs with background and environmental factors such as social isolation, poor parental mental health, or domestic and community violence, which may contribute to, sustain, or result from the substance abuse. So risks for the child extend beyond those directly related to the substance abuse itself, and are closely bound up with parental psychopathology, parenting practices, family environment, and socioeconomic factors. Effective interventions must take these and other 'ecological' factors into consideration (Ainsworth 2004; Conners et al. 2004; Dawe et al. 2006; Gruenert et al. 2004; NSW DoCS 2006; Patton 2003).

Children of substance abusers are more at risk of developing anxiety and depression disorders, psychological, emotional, behavioural, and physical conditions. School performance of these children may also suffer. Lifestyles of drug-using parents are also likely to make the home environment unsafe for young children, increasing risk of injury and mortality, and women who use illicit drugs are less likely to access prenatal and postnatal care (Ainsworth 2004; Conners et al. 2004; Dawe et al. 2006; Hegarty 2004; Johnson & Leff 1999; Kroll 2004; Patton 2003).

A high number of substance-abusing parents also have mental health problems, which can affect child development and wellbeing. Lack of parental availability (either mental or emotional) due to the effects of the substance, or lack of involvement and sensitivity is also likely to contribute to poor outcomes (Ainsworth 2004; Dawe et al. 2006; Hegarty 2004; McMahon et al. 2008; Parker 2008).

Parental substance abuse is also strongly associated with increased likelihood of child maltreatment (including abuse and neglect), and is regularly seen among families who come to the attention of child protection services, especially among substantiated cases of maltreatment (Ainsworth 2004; Chaffin et al. 1996; Dawe et al. 2006; Gruenert et al. 2004; Patton 2004; Vic DHS 2002; Walsh et al. 2003).

Illicit drug use carries additional risks for a child due to the illegal nature of the substances, because it increases the likelihood of exposure to criminal activity and of directly witnessing the substance use within the home (Dawe et al. 2006).

There is a clear pattern of socioeconomic-related risk factors associated with parental substance abuse. Parental substance abuse is most likely to occur in families experiencing financial disadvantage, unemployment, single parenthood, low parental education, family violence, and poor/unstable housing. In Australia, Aboriginal and Torres Strait Islander children are at significant risk of parental substance abuse (Conners et al. 2004; Dawe et al. 2006; Powis et al. 2000; Zubrick et al. 2005).

Child abuse and neglect

A critical component of optimal child development is a safe and nurturing environment, involving a warm and cohesive family/carer environment where the child is respected and appropriately supported. Child abuse and neglect refers to any non-accidental behaviour by parents, caregivers, other adults or older adolescents that is outside the norms of conduct and entails a substantial risk of causing physical or emotional harm to a child or young person. Such behaviours may be intentional or unintentional and can include acts of omission (that is, neglect) and commission (that is, abuse). Child maltreatment is commonly divided into five main subtypes: physical abuse, emotional maltreatment, neglect, sexual abuse and the witnessing of family violence (Bromfield & Higgins 2005).

Child abuse and neglect can have severe short-term and long-term effects on children's cognitive, socio-emotional and behavioural development, and has been linked to adaptational failure and psychopathology, both in later childhood and adulthood. Well documented outcomes include post-traumatic stress disorder, anxiety, depression, antisocial behaviour, eating disorders, behavioural problems, aggression, and delinquency. Maltreatment is also strongly associated with poorer academic performance and poorer adaptive functioning, reduced self-esteem, poor social skills, low academic ability, and language delays). Risks increase with severity of the abuse, and are particularly high where abuse is chronic. The age of onset of physical maltreatment may influence the type of outcomes; for example, an earlier age of onset may predict more symptoms of anxiety/depression, while a later age of onset predicts more behavioural problems. Additionally, Australian children who have had a report of child abuse or neglect are at slightly higher risk of death than other children, and at much higher risk of dying from external causes and non-accidental trauma. Children who are in the care and protection system also have poorer health, wellbeing and educational outcomes (Cashmore & Paxman 1996; Fleming et al. 1999; Glaser 2000; Green et al. 2010; Hildyard & Wolfe 2002; Mandell et al. 2005; Ronan et al. 2009; Zolotor et al. 1999).

Various factors may place children and young people at higher risk of abuse and neglect. These include family stressors, such as financial difficulties, social isolation, domestic violence, mental health problems, disability, alcohol and substance abuse, and lack of safe and affordable housing. Many of these factors are interrelated, and so exacerbate the problems faced by some families (Layton 2003; Tennant et al. 2003; Vic DHS 2002).

The adverse effects of abuse and neglect can last a lifetime. Adult survivors of childhood abuse and neglect have higher levels of alcohol and substance abuse, chronic diseases, homelessness, and mental health problems, such as depression, self-harm and post-traumatic stress. They are also more likely to experience abuse and violence in adulthood, and to abuse or neglect their own children (Lamont 2010). The short-term and long-term consequences of

abuse are thought to be related to the type, severity and duration of abuse, and the context in which it occurs (Felitti et al. 1998).

Maternal stress during pregnancy due to domestic violence, war or other traumatic experiences may place toxic stress on a fetus. Significant maternal stress during pregnancy, and poor maternal care during infancy both affect the developing stress system in the fetus or infant, and can affect brain development. However, secure attachment may buffer against the stress response, and avoid child development being impaired as a result of particular events of abuse. Parenting interventions have also been shown to be effective in reducing substantiated cases of child maltreatment (Glaser 2000; Hildyard & Wolfe 2002; Mandell et al. 2005; National Scientific Council on the Developing Child 2005; Prinz et al. 2009; Ronan et al. 2009; Sanders 2002, 2003, 2008).

Children as victims of violence

Being a victim of violence can be detrimental to a child's health, sense of safety and security, and feelings about the future. The negative effects of war and trauma may be particularly significant for refugee children. For some children, being victimised may lead to diminished educational attainment and social participation in early adulthood, or may result in physical injury, suicidal thoughts and behaviour, depression, disability and even death. Experience of violence is central to issues of community safety in general, and even more so for children who are the most vulnerable members of society (Arboleda-Florez & Wade 2001; Macmillan & Hagan 2004; Simon et al. 2002).

For many children, their personal experience of violence is as victims of child abuse. Physical and sexual assault can have complex short-term and long-term negative effects on the physical and psychological health of children. In particular, a history of child sexual abuse has been associated with psychopathology, depression, anxiety disorder, phobias, panic disorder, post-traumatic stress disorder, substance abuse, and violent and sexual offending later in life. Children who are victimised are at greater risk of perpetrating violence, and international approaches to crime prevention are increasingly recognising the strong links between youth victimisation and offending. Young victims of violent crime are also more likely than other young people to become victims of violent crime in adulthood (AIC: Johnson 2005; Lee & Hoaken 2007; Molnar et al. 2001; Rick & Douglas 2007).

Electronic media

Media technology is an integral part of children's lives. For children under 6 years, the main sources of media include television and DVDs, although increasingly children are playing video and internet-based games. For children aged 8-12 years, it is common to own mobile phones or iPods, or to access media such as instant messaging, interactive multiplayer video games, virtual reality sites, web social networks, and email. Media technology can be a powerful teaching tool, but some negative outcomes have also been linked to electronic media use. The impact of electronic media depends on the age of the child, the level of exposure, parental involvement in viewing, and the content of the media (Princeton University & Brookings Institution 2008).

Media exposure in children aged under 2 years may negatively influence cognitive development, and has been associated with attention problems in those aged 7 years. However, depending on the content, the relationship between exposure to television before age 3 years and subsequent attention problems may vary. For children aged more than 2 years, exposure to well-designed, age-appropriate, educational media programs, where

parents are concurrently involved in the experience, is associated with cognitive and academic improvement, whereas exposure to pure entertainment, and violent content in particular, is associated with poorer cognitive development and lower academic achievement (Christakis et al. 2004; Kirkorian et al. 2008; Princeton University & Brookings Institution 2008).

High levels of non-educational media exposure at all ages are associated with some negative outcomes, most commonly with obesity. National guidelines suggest less than 2 hours of non-educational screen time a day for children aged 5 to 12 years; however, research suggests most children regularly exceed this. Evidence also suggests that children who engage in more than 2 hours of screen time per day are more likely to: be overweight; be less physically active; drink more sugary drinks; snack on foods high in sugar, salt and fat; and have fewer social interactions. However, content type and commercials, for example those advertising foods of low nutritional quality, may have a greater influence on obesity than the amount of time spent viewing (AIHW 2009b; CSIRO 2009; DoHA 2004; Zimmerman & Bell 2010).

Social implications of various technologies can influence children's emotions and their relationships with others. For children aged less than 8 years, the viewing of media designed to promote pro-social behaviour can increase social capacities such as altruism, cooperation, and tolerance of others, but the content of some entertainment and news programs can also instil fear and anxiety in children. As children age, electronic media can provide links to the wider community where children can develop positive digital/electronic relationships; however, the number of hours spent and the content of media interactions is likely to vary the effects. Cyber-bullying is a risk factor associated with computer use, although it is restricted to internet-based media and mobile phones, which are less relevant to children under 12 years (Lippman et al. 2009).

Environment

Environmental factors include many physical, chemical and biological conditions and agents that may affect human health, both positively and negatively. Clean air, water and food, and safe human-made environments benefit the health and wellbeing of individuals and communities. On the other hand, the natural environment and natural disasters can be harmful, as can human-caused changes, such as poor urban design, land degradation, freshwater depletion and climate change (AIHW 2008a).

Environmental influences on health can be direct or indirect, obvious or subtle, straightforward or complex, and immediate or delayed. So assessing the full scope and size of the harmful effects that the environment can have on health is challenging. These effects include: diseases due to microbial contamination of food or water; diseases transmitted by insects such as mosquitoes; respiratory and heart diseases due to air pollution and to chemicals in workplaces; other consequences of chemical toxicity; damage from noise and heat; injuries due to poorly designed home, workplace environments or traffic systems; and effects on ecological systems (and consequently human health) associated with climate change.

Children have biological and behavioural characteristics that can place them at increased risk of exposure to environmental contaminants, relative to adults. For example, children have higher metabolic rates, which means they consume more oxygen, water and food (and any environmental hazards contained therein) per kilogram of body weight than adults. In addition, their normal growth may be affected when exposed to pollutants at critical periods

of development. Children also tend to spend more time outdoors than adults, participating in physical play and sports activities, which increases their exposure to certain environmental factors (for example, air pollution) (Hansen et al. 2003; Mathieu-Nolf 2002; Pike-Paris 2004; Yassi et al. 2001).

Infants and children are particularly vulnerable to air pollution, as they have less developed respiratory, immune and nervous systems, and have limited control over their exposure. Adverse environmental exposure has been increasingly recognised to contribute to chronic conditions, such as asthma, and exposure in early life can have life-long impacts. For example, exposure to traffic-related air pollution in early life limits lung growth and increases the risks of chronic respiratory disease in later life. Other conditions that have been linked to adverse environmental exposures include acute respiratory illnesses, mental disorders and obesity. In Aboriginal and Torres Strait Islander people there is also a high incidence of acute rheumatic fever, and those most at risk are children and young adults. Poverty and overcrowding, poor sanitary conditions, lack of education and limited access to medical care for adequate diagnosis and treatment are recognised as contributing factors to rheumatic fever (AIHW 2004b, 2009b; Sly et al. 2007).

As children are particularly susceptible to environmental risks it is important that we understand what they are being exposed to, and how this affects their health, to ensure that strategies are developed to protect them (Sly et al. 2007).

Environmental tobacco smoke

Environmental tobacco smoke is one of the most hazardous environmental exposures for children. Tobacco smoke contains numerous toxic and cancer causing chemicals that increase the risk of adverse health outcomes for children, including sudden infant death syndrome, acute respiratory infections, middle-ear infection (otitis media), onset and increased severity of asthma, respiratory symptoms and slowed lung growth. Children with parents who smoke are also more likely to take up smoking later in life (CDC 2007; Kestila et al. 2006; WHO 2007b).

Infants and children are particularly vulnerable to the effects of environmental tobacco smoke, because they have less developed respiratory, immune and nervous systems, and have limited control over their exposure. These vulnerabilities combined with exposure to tobacco smoke in enclosed spaces, such as the home or car, mean that children can be exposed to high levels of environmental tobacco smoke in a short period.

In homes where someone smokes inside, children have higher levels of cotinine, a biological marker for exposure to tobacco smoke, than children not exposed to tobacco smoke in the home. Children travelling in a car with someone smoking are also at risk, even if the windows are down (CDC 2007; Sendzik et al. 2008; Sly et al. 2007).

There is no safe level of exposure to tobacco smoke, and adults can do much to reduce or prevent a child's exposure, particularly by not smoking in the home or car. The benefits of reducing children's exposure to tobacco smoke in the home include improved health and school performance, reduced absenteeism from school, reduced uptake of smoking, and less frequent smoking among children who smoke (Commonwealth of Australia 2002).

Neighbourhood

Children are shaped not only by their family environment but also by the neighbourhood in which they live. Several neighbourhood characteristics influence child outcomes, including

the availability of local social networks, peer influences, quality of local services, economic opportunities, and exposure to crime and violence. Parental perception of these neighbourhood characteristics can have a significant impact on children's health, development and wellbeing (Curtis et al. 2004).

High neighbourhood quality has been associated with positive outcomes for children, including lower levels of child maltreatment and youth delinquency, and higher levels of physical and mental health and educational attainment. One of the most common indicators of neighbourhood quality is parents' perception of neighbourhood safety. This is often associated with how safe people feel when they are alone at home during either the day or night, and refers to individuals' perceptions of their vulnerability to, or protection from, personal harm. Fear of crime, whether founded or perceived, detracts from quality of life, and is a deterrent from participation in the local community (Ferguson 2006).

Parental perception of neighbourhood safety affects children's daily activities, as parents typically exert substantial control over where children spend their time. Fear of exposing their children to risks may lead parents to restrict their children from outdoor activities, particularly while unsupervised, which could lead to a more sedentary lifestyle and weight gain (Galster & Santiago 2006).

Outcome 3: Children have the knowledge and skills for life and learning

Social and emotional wellbeing

Social and emotional wellbeing incorporates various interdependent individual and environmental dimensions. Individual characteristics include experiencing, managing, and appropriately expressing emotions, regulating one's behaviour, and having resilience and coping skills, alongside confidence and persistence in learning. Individual characteristics involving relations with others include understanding emotions in others, developing social skills and empathy, and forming and maintaining relationships. Environmental factors contributing to social and emotional wellbeing include family characteristics such as relationships with parents or caregivers, and parental expectations. Family structure is not a key factor in child wellbeing, although family conflict plays a role. School and community-based factors include relationships with adults, peer relationships and the existence of support programs and activities (AIHW 2009b; Bernard et al. 2007; Bradshaw & Richardson 2009; Hoi Shan et al. 2008; National Institute for Health and Clinical Excellence 2009; Pitcl et al. 2006).

In Aboriginal and Torres Strait Islander communities, factors of particular cultural significance include spiritual and cultural domains, the importance of family and ancestry, connection with the land, and the relationship between these domains and an individual's social and emotional wellbeing. Issues specifically affecting Aboriginal and Torres Strait Islander communities such as grief, trauma, loss of culture and tradition, and issues concerning the forced removal of family members are also important. Experiences of racism and other forms of discrimination also have negative impacts on the social and emotional wellbeing of Aboriginal and Torres Strait Islander people (AIHW 2009b; de Maio et al. 2005; SA DoHA 2005; Zubrick et al. 2010).

There are positive and negative approaches to social and emotional wellbeing. Positive approaches emphasise children's capabilities, such as resilience, attentiveness, confidence,

social skills, positive emotions and self-concept including happiness, self-worth, sense of belonging, and enjoyment of school. Negative approaches emphasise mental ill health, such as depression and anxiety, behavioural problems, such as bullying or disruptive behaviour, risky behaviours, such as drug and alcohol misuse, and under-achievement at school. Some research notes a particularly strong influence of social and emotional wellbeing on school readiness and learning, and on positive educational achievement (AIHW 2009b; Bernard et al. 2007; National Institute for Health and Clinical Excellence 2009; Pitcl et al. 2006; Smart & Vassallo 2008; Weare & Gray 2003).

Social and emotional wellbeing has the potential to affect mental and physical health, education and skill attainment, social competence, and positive relationships. Psychological elements of wellbeing such as anxiety and stress can lead to impaired daily functioning, reduced social activity, poor school attendance, low self-confidence, poor academic performance, and feelings of physical illness (Story et al. 2008).

Early learning (home-based)

During the early years of a child's life, the brain requires environmental stimulation to promote normal development of language, memory, and cognitive processing skills. An infant or young child obtains much of their cognitive stimulation and lessons about the world from the environment provided by their carers. A rich home learning environment and parental/carer support through shared learning activities is therefore a key requirement for young children reaching cognitive development milestones (Foorman et al. 2002; Glascoe & Leew 2010; Lugo-Gil & Tamis-Lemonda 2008; Seginer 2006; Sénéchal 2006).

Early learning usually indicates the processes by which young children develop language, processing, and literacy skills, which are key development goals critical to many positive outcomes in later childhood (for instance, school and social success). The scientific evidence supports the association of positive child development outcomes with responsive parenting approaches that incorporate cognitive stimulation. Cognitive stimulation refers to parents making active efforts to promote their child's learning by providing a language-rich environment and actively engaging the child in activities that promote perceptual, linguistic and cognitive development. Children are also active agents in their own learning and development, and providing a rich home literacy environment for young children has been shown to improve children's reading, vocabulary, general information, and letter recognition skills upon entrance to kindergarten, which are all factors contributing to school readiness (Christian et al. 1998; Hoffman et al. 2006; Lugo-Gil & Tamis-Lemonda 2008; Pufall & Unsworth 2004).

Activities such as talking, playing and reading to the child are especially important in language and cognitive development, contributing to literacy and mathematics readiness scores (Christian et al. 1998; Fagan & Fantuzzo 1999; Glascoe & Leew 2010).

During talking, play and other shared activities with a young child, providing effective 'scaffolding' by the carer is particularly important. This is where parents provides just enough structure and support to help children's progression from one developmental level to the next, helping them achieve objectives that couldn't be attained on their own, and withdrawing support when no longer needed. This promotes the development of language skills and cognitive skills such as attention, memory, and complex independent problem solving (executive processing), which are critical for success at school. Scaffolding is also crucial to children's emotion regulation and behavioural functioning, which are in turn

associated with psychological and behavioural problems (Hoffman et al. 2006; Landry et al. 2002).

Home-based early learning activities are also associated with higher levels of child creativity, independence and self-competence, leading to more self-motivation in learning, and fewer externalising problems in kindergarten-age children. Once a child begins attending school, home activities such as discussing the school day, maintaining home education activities, and prompting motivation to learn have been shown to promote better early academic outcomes (Culp et al. 2000; Evangelou et al. 2008; Izzo et al. 1999; Mantzicopoulos 2003; Parker et al. 1999; Seginer 2006; Sheldon & Epstein 2005).

Socioeconomic factors play a large role in predicting the quality of the home learning environment and reading ability of young children, and parental education and income are significantly associated with early-learning parenting practices and higher parental involvement. Family structure and size may also be associated with early learning activities, as well as general parent-child relations and family relations (Evangelou et al. 2008; Garcia-Coll et al. 2002; Rodriguez et al. 2002; Seefeldt et al. 1999; Seginer 2006; Sénéchal & LeFevre 2002; Tamis-LeMonda et al. 2004; Weitzman et al. 2004).

Early childhood education attendance

The early years of a child's life is a period of intense learning that provides the foundation for later academic and social success. Increasing numbers of children attend early childhood education programs before starting their formal school years, including preschools, playgroups, nursery schools, school readiness interventions, home visit scenarios, or childcare centres. Children who have participated in high-quality early childhood education perform better academically than their peers, and children who are socially disadvantaged show the most benefit. Early childhood education therefore has great potential to close academic performance and attainment gaps between children from different socioeconomic backgrounds (Elliott 2006; Moore 2008).

Studies have repeatedly shown that children who attended early education interventions or programs showed better performance and progress in their early school years in almost all intellectual, cognitive, and school domains, and many socialisation domains. These benefits help improve school readiness, school transitions and student motivation. Studies have also shown improvements, sometimes of smaller magnitude, for socio-emotional/social adjustment outcomes such as self-esteem and social behaviour (Barnett 1995, 2008; Boocock 1995; Burchinal et al. 2009; Campbell et al. 2002; Elliott 2006; Entwisle 1995; Moore 2008; Press & Hayes 2000; Yoshikawa 1995).

Recent research has focused on the role of the quality of the education setting in determining child outcomes: while a high-quality education program can provide an important head start for children in making the transition to school, low-quality education programs can provide no benefit or even cause children to perform less well. Quality includes elements such as group size, adult to child ratio, supervision level, teacher sensitivity, richness/quality of staff interactions, learning/emotional climate, curriculum content, and teacher/caregiver qualifications (Burchinal et al. 2009; Braveman et al. 2008; Elliott 2006).

Children from socially disadvantaged backgrounds who are exposed to factors such as a low family income, a single parent, low maternal age, low parental education, and overcrowded households have often been shown to be at risk for poorer cognitive abilities and school outcomes. Ethnicity may also play a role in determining risk for poor school performance, due to associated communication problems for both child and parent. Focused early

educating interventions have been shown to be effective at overcoming many of these risks (Biedlinger 2009; Burchinal et al. 2009; Elliott 2006; Rosenberg et al. 2008).

Transition to primary school

Children entering school with basic skills for life and learning are more likely to have a successful transition to primary school. Schooling transition issues relate to emotional competence, capacity for engagement with others, and resilience in meeting the demands of schooling. Children who make a successful transition to school have higher levels of social competence and academic achievement compared with those who have difficulty making this transition. Conversely, children who enter school not yet ready for school-based learning have lower levels of academic achievement, and are at an increased risk of teenage parenthood, mental health problems, committing criminal activity, and poorer employment outcomes (AIHW 2009b; Farrar et al. 2007; Shepard & Smith 1989).

Issues around the transition to full-time primary school for children are discussed under various conceptual theories, including readiness for learning and readiness for school. Readiness to learn refers to the level of development at which a child is ready to learn specific materials; readiness for school refers to the level of development at which a child can fulfil schooling requirements and understand the curriculum. School readiness can be described in terms of age, stage of development, a demonstrated set of skills, or relationships and interactions. In most countries, school entry is based solely on age—in Australia some states offer school entry as early as 4 years and 7 months. Recently, the understanding of what constitutes school readiness has been broadened from focusing on these child factors, such as age or specific skills and competencies, to shared responsibilities of families, schools and communities in providing the environments and experiences that support the healthy development of children. Dockett and Perry (2007) discuss three dimensions of school readiness: a child's readiness for school; the school's readiness for children; and family and community supports and services that contribute to the child's readiness (AIHW 2009b; Dockett & Perry 2007; Farrar et al. 2007).

Factors that affect the school readiness of children at individual, family and community levels include: socioeconomic status; child health; family characteristics, such as family type, parental education and mental health; the home and community environment; and participation in a quality preschool program. Several studies, including the Effective Provision of Pre-School Education Study in the United Kingdom and the High/Scope Perry Preschool Program in the United States, have demonstrated the effectiveness of high-quality, focused preschool programs in reducing the effects of social disadvantage, developing children's social competency and emotional health, and preparing children for a successful transition to formal schooling (Boyd et al. 2005; Farrar et al. 2007; Sylva et al. 2003) (see also the 'Early childhood education attendance' section).

Parental involvement in education

Parents play a pivotal role in their child's educational outcomes by providing supportive and learning-compatible home environments, and by participating in child learning and skill-acquisition. While this process begins with home support of early learning through positive parenting practices and approaches, parents who maintain their academic support after their child begins attendance at formal education settings, through interaction and involvement with the school or preschool, significantly improve their child's chance of academic success throughout their school years, including reading, writing and mathematics

achievement, and help reduce the chance of their child developing learning problems. Parental involvement in school is also linked to various better adaptive outcomes, including fewer internalising and externalising problems, and better levels of self-regulation, self-esteem, and social competency. Similarly, parental involvement in child care settings has beneficial outcomes for the child (Arnold et al. 2008; Berthelsen & Walker 2007; Brody & Flor 1998; Edwards et al. 2008; Griffith 1997; Izzo et al. 1999; McWayne et al. 2004; Seginer 2006; Sheldon 2002, Sheldon & Epstein 2005; Shumow et al. 1996; Weiss et al. 2008; Zellman & Perlman 2006).

Family involvement may be even more important for preschoolers and those making the transition to school, as contextual emotional and learning support can be critical to school readiness and a successful transition (Downer et al. 2008).

School-based parental involvement has strong associations with socioeconomic status, single-parent status, and parental education. Involvement also varies by sociocultural factors, such as ethnicity and immigrant status, likely because of language difficulties and differing belief systems about education practices. Schedule conflicts and having a young child at home have been found to be barriers to involvement (Arnold et al. 2008; Desforges & Abouchaar 2003; Espinosa 1995; Grolnick et al. 1997; Kohl et al. 2000a; Lamb-Parker et al. 2001; McWayne et al. 2008; Peters et al. 2008; Seginer 2006; Wong & Hughes 2006).

Outcome 4: Children benefit from better social inclusion and reduced disadvantage, especially Indigenous children

Family economic situation

For most families, regular adequate income is the single most important determinant of their economic situation. Children living in families without adequate income are at a greater risk of poor health and educational outcomes, both in the short-term and long-term. Children living in low-income families are more likely to have insufficient economic resources to support a minimum standard of living. This can affect a child's nutrition and access to medical care, the safety of their environment, level of stress in the family, quality and stability of their care, and provision of appropriate housing, heating and clothing. Studies have shown that children from low-income families are more prone to psychological or social difficulties, behavioural problems, lower self-regulation and elevated physiological markers of stress. An emerging field of research is investigating children's perspectives on economic adversity. Redmond's (2008) review reveals that a primary concern of economically disadvantaged children is being excluded from activities that other children appear to take for granted, and the embarrassment that this can cause. Despite the importance of adequate income in alleviating poverty and contributing to personal health and wellbeing, income poverty is just one dimension of poverty:

> Poverty encompasses a multitude of deprivations that are related, but not restricted, to low income or income inequality…aspects of living that are not easily named or measured, such as quality of life, social cohesion, family and social networks, autonomy and opportunity for future prosperity are also important in assessing levels of poverty. (Carson et al. 2007).

In this sense, children who are economically disadvantaged are not necessarily the most disadvantaged children. Close family relationships, particularly closeness to at least one parent, appear to protect children from the worst effects of economic disadvantage. In contrast, economic disadvantage coupled with low family support, or strained or abusive relationships can cause children to lower their aspirations, exclude themselves from activities or engage in antisocial behaviour (ABS 2006a; AIHW 2009b; Barnett 2008; Heady et al. 2006; Shore 1997).

Parental employment

Parents' employment patterns have a significant impact on the financial wellbeing of the family. Parental employment increases the economic resources available to families, and protects against social exclusion and inter-generational disadvantage. It also provides a positive role model for children in terms of work ethics and social responsibility (AIHW 2009b).

Secure employment provides financial stability, self-confidence and social contact for parents, with positive effects flowing on to their children. Conversely, members of households where no-one is employed report worse physical and mental health, as well as lower life satisfaction than members of households where someone is employed. Jobless

families are disproportionately likely to be reliant on welfare, have low incomes, and be under financial stress. Studies on the effects of unemployment on other family members have found relationships between parental joblessness and family conflict, family breakdown and child abuse (Heady & Verick 2006; McClelland 2000).

Parental education

Inadequate education and training is a common factor in Australia's most disadvantaged communities, and may increase their risk of social exclusion. Children share the same social and economic circumstances as their parents, and there is a link between intergenerational poverty and educational attainment (AIHW 2010b; Vinson et al. 2007).

Children are strongly influenced by their environment, which is largely shaped in their early years by their primary caregivers. Parental characteristics, including demographic and socioeconomic factors, therefore play an important role in determining child outcomes. Parental education level (especially maternal education) has some level of influence on most aspects of the child 'ecosystem', such as interactions with the child, quality of the home environment, family functioning, community environment, school choice, and socioeconomic context, and is a significant factor in child development (Lugo-Gil & Tamis-Lemonda 2008).

Children of parents with higher educational attainment demonstrate better cognitive and academic outcomes, which emerge early and can have lifelong implications. Children of parents with higher educational qualifications demonstrate better school performance and engagement. Parental education has positive effects on parents' role definition (seeing themselves as educators) and parental self-efficacy (feeling confident they can make a difference to their child's learning). Higher parental education improves child educational aspirations and academic motivation, which are important for school success (Considine & Zappalà 2002; Desforges & Abouchaar 2003; Garg et al. 2002; Halle et al. 2009; Magnuson 2007).

Parents with more education themselves may provide increased intellectual stimulation for their child, provide a richer educational home environment, serve as a model for good educational values, promote the importance of personal fulfilment, and participate more in their child's schools (DeGarmo et al. 1999; Desforges & Abouchaar 2003; Garg et al. 2002; Green et al. 2009; Kohl et al. 2000a; Melhuish et al. 2001).

Families with low educational level might place less value on education, in a trend sometimes described as the 'culture of poverty'. They might have less social capital, in the form of social networks, which encourage community and school participation. They also might feel less confident, or marginalised, in dealing with their children's schools (Desforges & Abouchaar 2003; Kohl et al. 2000a; Nechyba et al. 1999).

Low parental education is also related to various adverse health outcomes for the child. Low maternal education is linked to decreased use of antenatal care, low birthweight babies, smoking during pregnancy, stillbirths and other forms of infant mortality, lower likelihood of initiating and persisting in breastfeeding, and poorer general child health, including dental decay (Acevedo-Garcia et al. 2007; Arntzen et al. 2008; Boyle et al. 2006; Du Prel et al. 2006; Hallett & O'Rourke 2003; House of Representatives Standing Committee on Health and Ageing 2007; Kalil et al. 2009; Luo et al. 2006; WHO 2007c; Yu 2008).

Educational attainment level is strongly associated with several other markers of socioeconomic status. Higher educational qualifications predict better employment opportunities, and are associated with decreased periods of unemployment and higher

income. By contrast lower educational qualifications are often associated with factors such as financial disadvantage, unemployment, being a single parent, and a younger maternal age. Environmental risk factors, such as poor housing conditions and unsafe neighbourhoods are also associated with low maternal education. So children of parents with low educational attainment are exposed to various other biological, environmental, and social risk factors that contribute to the observed poor outcomes (Cassen & Kingdon 2007; Conners et al. 2004; Du Prel et al. 2006; Loeb et al. 2007; Powis et al. 2000).

Access to services

The availability and accessibility of health, welfare and social services to mothers, families and young children, as well as their performance in delivering timely and appropriate care, affect child outcomes, particularly physical health, but also mental health and wellbeing. Further, social and welfare services, such as treatment and support services play a critical role in supporting families and minimising or complementing statutory intervention from departments responsible for child protection. These services deal with the underlying problems within families; for example poverty, unemployment or parental health issues (AIHW 2004a; Bromfield & Holzer 2008).

Promoting universal access to health services—in Australia, particularly through access to general practitioners—is a crucial part of maintaining good public health, and is a fundamental human right. In Australia, there is significant discrepancy in primary care access by remoteness, with many groups living in rural and remote areas being significantly disadvantaged; this particularly affects Aboriginal and Torres Strait Islander populations (AHMAC 2008; AIHW 2004a; Bailie et al. 2009; McGrail & Humphreys 2009a, 2009b).

Widespread access to primary care, as compared with specialists or inpatient services, can be effective in preventing disease progression on a population scale. Consequences of a lack of access to health care include foregoing necessary health care, paying more to access health services (for example, due to long-distance transport costs), and often suffering poorer health outcomes. The availability of primary and preventive care reduces the rate of avoidable hospitalisations (for example, ambulatory care sensitive conditions) and deaths, including among children (AIHW 2004a; Friedman & Basu 2001; Guagliardo 2004; McGrail & Humphreys 2009a).

Affordability and cultural appropriateness is an important aspect of service access, which has the potential, for example, to reduce rates of low birthweight and increase breastfeeding patterns, both of which have long-term health and cognitive effects on the child. Affordability is also a critical barrier for many families being able to access quality education programs and early intervention services, resulting in adverse outcomes for children (Brameld et al. 2006; Panaretto et al. 2007; Tran et al. 2002) (see 'Preschool/child care affordability').

Access to services can also be important for children's social and behavioural outcomes. Service waiting lists, availability, and lack of flexibility have been found to be a barrier to schools referring children to mental health services. Lack of use of these services may result in persisting social functioning problems, such as depression or anxiety disorders. Likewise, at-risk children, such as those with attention deficit disorder/hyperactivity may not be receiving the specialist mental health services they require to manage resultant poor social and academic outcomes (Allison et al. 2008; Hunt 2009; Szatmari et al. 2006).

The quality and timeliness of health care and professional guidance in hospitals in the early postnatal period have been shown to be often unsatisfactory in Australia. The early postnatal

period is an important time for establishing patterns, such as successful breastfeeding, which is strongly associated with various positive child outcomes, and support from health professionals can be key to ensuring this. However, administrative protocols and concerns about limited bed space often result in inadequate care and support being provided to new mothers (Forster et al. 2008; McLachlan et al. 2008; NHMRC 2003; Rowe-Murray & Fisher 2002; Schack-Nielsen & Michaelsen 2006).

People living in rural areas are also disadvantaged on service timeliness, as increased distance can cause longer wait times to treatment via ambulance services. Early and timely access to ambulance services has been shown to improve clinical outcomes; for instance, in relation to asthma (Morgans et al. 2005).

In young children, timeliness of immunisation is an important health indicator relating to mortality and morbidity, and delayed vaccinations occur with disproportionally high frequency among Aboriginal and Torres Strait Islander children. Factors relating to health service administration, such as inconsistent systems of delivery, recording and communication methods, represent risks for lack of timeliness in this area (Bailie et al. 2009).

Many factors are associated with teenage birth including family history of teenage pregnancy, sexual abuse in childhood, unstable housing arrangements, poor school attendance and performance, socioeconomic disadvantage, absence of a father figure, living in rural and remote areas, and being Aboriginal or Torres Strait Islander. While not all teenage births result in negative outcomes for mother and child, the circumstances that often contribute to teenage birth mean that many young mothers do not receive the support they need during and after the birth. There is also the question of whether certain groups of young women have adequate support to avoid unintended pregnancy. Knowledge about reproductive matters and access to contraception are important factors in preventing unintended teenage pregnancies (AIHW 2009b; Slowinski 2001).

Outcome 5: Children are engaged in and benefiting from educational opportunities

School engagement

School engagement incorporates behavioural, emotional, and cognitive dimensions, which interact to determine child outcomes. Behavioural engagement may involve positive conduct (such as adhering to rules and not behaving disruptively, including skipping school), active involvement in learning tasks (paying attention, and participating in discussions), and participation in school-related activities. Emotional engagement incorporates student emotional reactions to the teacher and school, such as interest, anxiety, boredom, or happiness/sadness, and overlaps with student attitudes and motivation. Cognitive engagement involves investment in learning (including motivation), self-regulation and strategic problem-solving, and preference for challenges (Birch & Ladd 1997; Buhs & Ladd 2001; Finn & Rock 1997; Fredricks et al. 2004; Lippman & Rivers 2008; Stipek 2002).

In addition to academic development, engagement can also affect socio-emotional development, as students who are more engaged and succeeding in their school work tend to have higher levels of wellbeing.Children with higher engagement levels typically demonstrate better academic achievement throughout school, and are also more likely to complete secondary school, which is important for positive life outcomes such as income levels and better health (Alexander et al. 1997; Finn & Rock 1997; Fredricks et al. 2004;

Heaven & Newbury 2004; Jennings 2003; Jimerson 2003; Lippman & Rivers 2008; Marks 2000; Mehan et al. 1996; Sinclair et al. 2003).

School engagement may also carry other non-school related benefits for students, such as lower rates of sexual activity, delinquency, substance use, and teenage pregnancy. These risky behaviours have all been associated with increased school truancy and lower educational engagement (Lippman & Rivers 2008; McAra 2004; Pillow 1997).

Engagement is determined by a complex interaction of child-, family-, school- and social context-related factors. Child-related factors such as gender, temperament, parenting practices and the home environment affect engagement levels. School-related factors such as the school climate, class structure, type of school, teacher support, curriculum content and delivery, and the peer environment encountered at school also play a critical role in engagement levels (Adermann & Campbell 2008; Birch & Ladd 1997; Buhs & Ladd 2001; Croninger & Lee 2001; French & Conrad 2003; Fredricks et al. 2004; Fullarton 2002; Guthrie & Wigfield 2000; Heaven & Newbury 2004; Hyman et al. 2003; Jennings 2003; Jimerson 2003; Kindermann et al. 1996; Ladd et al. 1999; Lippman & Rivers 2008; Marsh 2000; Ogbu 2003; Ryan & Patrick 2001; Skinner & Belmont 1993; Subrahmanyam & Greenfield 2008; Valeski & Stipek 2001; Vetiska et al. 2000).

Students from lower socioeconomic backgrounds, minority ethnicity, and from families with lower levels of parental education demonstrate lower levels of school engagement. Socially disadvantaged students also experience much more severe consequences when disengaged, often dropping out of school, and consequently facing very limited life opportunities. In Australia, Indigenous populations are the most educationally disadvantaged, and have significantly lower levels of school attendance, engagement, and retention (Adermann & Campbell 2008; Fullarton 2002; National Research Council & Institute of Medicine 2004; Ogbu 2003).

School attendance

Regular school attendance is critical to successful student outcomes, and primary school provides the first compulsory educational experience for Australian children. School attendance helps children develop the basic building blocks for learning and educational attainment, as well as social skills, such as friendship building, teamwork, communication skills and healthy self-esteem. Regular attendance and participation in schooling is therefore an important factor in educational and life success. Children who regularly miss school are at risk of missing out on these critical stages of educational development, and may have long-term difficulties with their learning, which may result in fewer educational and employment opportunities. Absenteeism can also exacerbate issues of low self-esteem, social isolation and dissatisfaction (Vic DHS 2006).

The importance of all children attending primary school is not restricted to Australia or developed countries, but is increasingly being recognised worldwide as a crucial factor in children's development and wellbeing. Achievement of universal primary education (that is, enrolment, attendance and completion) has been identified as one of the eight United Nations Millennium Development Goals.

Children's health affects whether or not they attend school, and their ability to learn and participate in school activities. A high proportion of Aboriginal and Torres Strait Islander children have chronic health problems, such as middle ear infection and nutritional deficiencies, which negatively affects their school attendance and learning outcomes. Further, Indigenous students have higher rates of absenteeism and suspension, and lower

retention rates than non-Indigenous students, which limits their future life choices and ability to achieve their full potential. Increasing attendance at primary school for disadvantaged populations, particularly for Aboriginal and Torres Strait Islander children, will help to reduce the considerable gap that currently exists in academic achievement between population groups within Australia. The Western Australian Aboriginal Child Health Survey has shown a direct relationship between the number of days absent from school and academic performance (AIHW & ABS 2005; MCEETYA 2001; UNICEF Innocenti Research Centre 2009; Zubrick et al. 2006).

Literacy and numeracy

Just as language development in early childhood lays the foundation for formal education, literacy and numeracy skills acquired in the schooling years are the building blocks for further educational attainment, social development and employment. A national education goal is for every child leaving primary school to be numerate and able to read, write and spell at an appropriate level (AIHW 2009b).

Literacy means more than just being able to read and write—literacy is integrally related to learning in all areas of the curriculum, and enables individuals to develop knowledge and understanding. Numeracy is also central to many areas of education, and also life outside of school. It allows problems to be analysed and solved, is important in many types of employment, and helps people manage their day-to-day lives (AIHW 2009b).

Several factors are associated with children's level of literacy and numeracy, including the home environment, and engagement with the school environment. In the home, the number of books available, the amount of time parents spend discussing books with their child, the presence of study aids (desk, computer and dictionary) and the educational attainment of parents have been associated with literacy and numeracy levels. Although children from low-income families are more likely to have problems that interfere with learning outcomes, the relationship between socioeconomic disadvantage and educational outcomes can be mediated by the home environment—with access to reading materials and parental encouragement to read at home, students from disadvantaged backgrounds have been found to outperform students with relative socioeconomic advantage but lower levels of reading engagement. In terms of the school environment, children who engage in school activities, and express positive feelings towards school are more likely to have higher educational aspirations, grades and retention to Year 12 (AIHW 2009b; Clark & Akerman 2006; Farrar et al. 2007; OECD 2002).

Outcome 6: Families are confident and have the capabilities to support their children's development

Family interaction/functioning

Families are typically the most important socialising agent for children. The family environment and emotional context has a lasting effect on children's wellbeing and attitudes to the world around them. Families with high levels of family functioning interact effectively to provide the best environment for their children, who grow up to be strong, resilient, and emotionally healthy, and can cope well with adverse conditions. Models of strong families

usually describe those that are cohesive, flexible and communicate well (DeFrain 1999; Lugo-Gil & Tamis-Lemonda 2008; Olson & Gorall 2003).

Strong families and positive parenting practices produce better socialisation outcomes, and positive engagement in school and other settings. Aggressive behaviour and delinquency in children and young adults has a strong association with family dysfunction, as does bullying involvement (as bullies/ victims) (Fergusson & Horwood 2002; Geggie et al. 2000; Ispa et al. 2004; Skinner et al. 2005).

Socioeconomic status has been suggested to play a key role in family functioning, as parental background factors and family resources are associated with family interactions and parenting quality. Higher levels of maternal education, age, and language/cognitive skills, father's residency and family income have been shown to be associated with more supportive parenting. However, both high- and low-income families are at similar risk for lack of parental closeness, parental values, family meal times, and emphasising integrity (Lugo-Gil & Tamis-Lemonda 2008; Luthar & Latendresse 2005).

Parenting quality

As children develop, they actively learn from the world around them. Their primary caregivers, usually their parents, play a key role in child socialisation and early development by providing lessons and resources, both physical and emotional. While children's cognitive, educational and socioeconomic outcomes benefit from the time and material resources provided by parents, it is also necessary to consider the 'quality' of the parent-child interaction in determining outcomes. Parenting style, including the way in which a parent cares for, instructs, and reacts to the child, can have lasting effects on that child's development, attitudes and outcomes, shaping their capacity to cope and adapt throughout childhood. Extensive research on parenting practices has found risks and benefits associated with particular approaches to child-rearing (Amato & Rivera 1999; Collins et al. 2000; Lugo-Gil & Tamis-Lemonda 2008).

It is widely accepted that an 'authoritarian' parenting style, characterised by high levels of control and low levels of acceptance, can cause various negative outcomes for the child, particularly delinquency and aggressive behaviour problems, including bullying. Harsh parenting and discipline has also been shown to have negative effects on children's academic performance and outcomes. Harsh parenting styles may be perpetuated across generations, as patterns of aggressive childhood behaviour often extend into adulthood and determine that individual's parenting strategies. Conversely, authoritative parenting is associated with better outcomes throughout childhood, including better cognitive ability, better school outcomes, fewer conduct problems, better self-esteem, better psychological adjustment, improved resilience, and better social competence and peer relations (Ahmed & Braithwaite 2004; Amato & Rivera 1999; Dadds et al. 2003; Durrant et al. 2004; Heaven & Newbury 2004; Ispa et al. 2004; Landry et al. 2002; Pettit et al. 1997; Power 2004; Lugo-Gil & Tamis-Lemonda 2008; Runions & Keating 2005; Shears & Robinson 2005).

As well as broad parenting style, specific positive parenting practices can have beneficial effects—and often, the greater the number of positive practices, the better the child outcome. Talking, playing and reading are especially important in language and cognitive development (Glascoe & Leew 2010).

As the quality of parenting has a major effect on children's development, parenting programs can significantly improve children's mental health and wellbeing, and reduce behavioural problems, by improving parental knowledge, skills and confidence. Research

has shown that adverse effects resulting from a lack of positive parenting can be apparent by 6 months of age, and time compounds the effect, so that the older the child is the larger the performance gap; this indicates a need for early intervention (Glascoe & Leew 2010).

Maternal age, education, and language/cognitive skills have all been shown to be positively associated with more supportive parenting, as are father's residency and, to a lesser extent, family income. Factors associated with fewer positive parenting behaviours include more than three children in the home, multiple moves, and parental depression (Glascoe & Leew 2010; Lugo-Gil & Tamis-Lemonda 2008; Sanders 2008; Turner & Sanders 2005).

Parental and family health

A child living with a chronically ill parent or parent or sibling with disability can negatively affect his or her health and wellbeing. A parent with a chronic illness, such as kidney failure or mental illness, may experience frequent medical procedures and hospitalisations, loss of income, dependency on other family members, changes to body appearances, social stigmatisation, and, in some conditions, the possibility of premature death (Romer & Barkmann 2002).

In these circumstances, the physical, emotional or economic needs of children may not be met, increasing their risk of long-term mental health and behavioural problems. Studies have also shown that children whose parents have a mental illness are also more likely to experience learning disabilities and perform poorly academically, and are susceptible to substance abuse (Barkmann et al. 2007; Romer & Barkmann 2002; Kowalenko et al. 2000; Lancaster 1999).

While many parents who have a chronic illness or disability are capable parents, these health problems can affect the parent–child relationship. Depending on the severity of the parental illness or disability, the wellbeing of children may be affected by factors such as family discord, discontinuity of care, poor parenting skills, social isolation, and poverty, and they may have developmental delays (ABS 1999; AICAFMHA 2001; McConnell et al. 2003).

A child living with a chronically ill parent or parent with disability may also take on greater responsibilities, or, in some cases, care for the parent. Taking on a caring role may be rewarding, but it can also significantly affect the life of a child or young person. These children may be less involved in community, educational and social activities. The ability of children to cope in these circumstances varies with their age, gender, developmental stage, personality, severity of their parent's health condition, and the support they receive from other family members (Carers Australia 2001; Steck et al. 2005).

Children living with parents who are problematic alcohol or substance users are also at greater risk of poor health and wellbeing outcomes.

Family social network

Family social network refers to a child's social network comprising his or her immediate family and other groups, as well as the family's broader social network. The relationships and interactions within the child's social environments are all interconnected. The quality of these relationships and interactions affects children's health, development and wellbeing, as higher quality interactions can help people access financial and material resources and practical and emotional support that are essential for children's health, development and wellbeing. Support provided by social institutions, as well as the social support that parents obtain from formal and informal social networks, is important to healthy child development

and overall child wellbeing (Ferguson 2006; Runyan et al. 1998; Sheldon 2002; Waters et al. 2002; Wise 2003; Zubrick et al. 2008).

Social support and sharing experiences with other parents can support better parenting, and result in improved outcomes for children, including: decreasing the likelihood of the children dropping out of school, committing delinquent acts or joining gangs; increasing the likelihood of the children finishing school and gaining employment; positive behavioural outcomes for at-risk preschool children; and lower levels of depression in at-risk teens. Good social supports can also act as a protective factor against socioeconomic stressors, and buffer the effects of other risk factors. Conversely, living in isolation from extended family networks and support services is associated with less effective parenting behaviours and practices, and poorer parental mental health, which are strongly associated with poorer health, development and wellbeing outcomes for children (Ferguson 2006; Wise 2003; Zubrick et al. 2008).

Social capital is an important aspect of the social context in which a child develops. Social capital refers to networks of social relationships, characterised by norms of trust and reciprocity; it is the name given to quality relationships that enable people to come together to collectively share experiences or resolve problems, and where all involved can achieve mutually desired benefits. Strong connections between individuals promote a sense of belonging, and provide access to support. This can be represented by the degree to which people feel they can get help from neighbours, allow their children to play outside safely, and participate in community activities. High levels of trust in other people are also associated with positive outcomes for children. Trust in others promotes exchanges of resources and support. Conversely, low levels of trust within a neighbourhood are associated with poor child outcomes. High levels of social participation also contribute to the resilience of individuals and communities, and to the overall wellbeing of society (Ferguson 2006; Stone & Hughes 2000; Zwi & Henry 2005).

Families with rich social networks have been found to have increased access to information, material resources and friends and neighbours to help them manage their daily lives and problems. For children, the benefits of social capital include positive mental health and behavioural outcomes in childhood and later life, reduced school dropout rates and an increased likelihood of gaining meaningful employment. Strong family relationships and supportive neighbourhoods protect children and young people against the adverse effects of socioeconomic disadvantage, leading to improved health for children and youth in economically poor communities (Ferguson 2006; Zwi & Henry 2005).

Early intervention services for children

Children with developmental delays and disabilities can benefit considerably from programs specifically designed to improve development or minimise limitations caused by disability. Research has shown that due to the intense physical and neurological development processes occurring in early childhood, the earlier the intervention, the better the potential for improved outcomes for the child.

There are various 'early interventions' and services for vulnerable or high-risk families and children. These programs are designed to prevent or minimise adverse cognitive, emotional, physical or material limitations of children with environmental or biological risk factors—risk factors which often arise from or are associated with social disadvantage (Blackman 2003).

However, in Australia and internationally, 'early childhood intervention' often refers specifically to the process of providing support and services for young children who have or are at risk of developing disabilities or developmental delays, and their families. These programs span functional and participation domains, and aim to improve child development and wellbeing, avert the need for special education or institutionalisation, provide family support, and increase community participation and social inclusion. In cases of children with disabilities, as for other disadvantaged children, specialised support early in childhood provides the best chance of reducing functional limitations throughout childhood and later in life (Blackman 2003; Bruder 2010; Early Childhood Intervention Australia (Victoria) 2007; Johnston 2006; Shonkoff & Phillips 2000).

Early intervention for infants who were born prematurely have been successful at decreasing the risk of health conditions and developmental delays, particularly among those vulnerable to other risk factors. Preventative early intervention for disadvantaged mothers can result in various benefits for children, including improved mental health and school readiness, and reduced numbers of injuries. Early intervention services can also be effective in reducing waiting times for access to health services and procedures, and in increasing access to therapy session. Families who are receiving effective and satisfactory early intervention services are also more likely to seek help from health care providers when needed (Bell et al. 2010; Blackman 2003; Moore & Sargood 2005; Oates 2010).

Language delays in particular are among the most common developmental impairments found in young children, and are an important target for early intervention. With regard to more general early intervention services, such as parenting programs, barriers to participation appear to include: lack of awareness; service accessibility, including location, availability, and cost; perception of the organisation; and social stigma. Parents who are less likely to access early parenting intervention programs are fathers, parents with disability, parents of teenagers, families from a minority background, rural families, and homeless families (Katz et al. 2007; Oates 2010; Sajaniemi et al. 2010).

Teenage births

Teenage pregnancies are associated with significant health and social problems for the infant and the mother. Teenagers who become pregnant experience significantly higher rates of adverse birth outcomes, particularly preterm delivery and low birthweight, which lead to increased incidence of neonatal mortality. Several types of congenital anomalies have higher incidence among babies of teenage mothers and infants may also be at greater risk of infection, sudden infant death syndrome, and general increased morbidity during their first year. Evidence shows that the younger the mother, the higher the risks of poor outcomes for the baby (Chen et al. 2007; Conde-Agudelo et al. 2005; Malamitsi-Puchner & Boutsikou 2006).

There is also a higher risk of immediate complications for the mother, including anaemia, uterine infection, episiotomy, postpartum haemorrhage, and maternal death. Teenage births may also have long-term effects on the ability of the mother to care for her infant, due to interrupted schooling, greater problems entering the labour market, and high likelihood of economic hardship (Conde-Agudelo et al. 2005; Malamitsi-Puchner & Boutsikou 2006; Raatikainen et al. 2006; Sleebos 2003).

While the association of particular risk factors is difficult to determine due to complex interactions between biological and social factors, there are factors common among teen mothers that compound the risk of poor outcomes, including inadequate prenatal care, inadequate weight gain in pregnancy, smoking and alcohol use during pregnancy, emotional

stress and lack of family support (Chan & Sullivan 2008; Chen et al. 2007; Raatikainen et al. 2006).

Outcome 7: Quality early childhood development services that support the workforce participation choices of families

Preschool/childcare affordability

The substantial and positive effects of quality early childhood care and education on children's social and cognitive development are well established. High-quality and integrated early childhood education and care services are critical to increasing the proportion of children entering school with the basic skills for life and learning (COAG 2006).

Extensive research into the effect of the quality of child care in the early years has found high-quality child care to be beneficial, as it provides a stimulating, educational and caring environment that helps a child's social, educational and physical development. High-quality care has also been found to have positive effects on children's social and emotional wellbeing, and has important social and economic effects on families. Further, children who attend high-quality child care centres perform better in cognitive and social skills, and are more ready to make the transition to preschool and primary school. High-quality early childhood education and care has also been shown to be effective intervention for children from socioeconomically disadvantaged backgrounds, and has been found to reduce future social problems, such as crime, unemployment and teenage pregnancies (Buckingham 2007; Cassells et al. 2005; Elliot 2006; Harrison 2008; House of Representatives Standing Committee on Family and Human Services 2006).

In some Australian states and territories, preschool services are delivered by the non-government sector for a fee. The cost of child care services is often mentioned by parents as a barrier to access, and changes in the level of government funding and assistance to families influence the affordability of children's services. The capacity of a family to pay for early childhood education is dependent on income, eligibility for subsidies and rebates, the fees charged and other associated costs, the number of children in early childhood education, and the broader costs incurred by the family (AIHW 2007).

Socioeconomic status is one of the critical factors for lack of participation in quality education programs and early intervention services. Remoteness also plays a role. Some studies have shown that despite its potential to reduce disadvantage gaps, families with lower incomes or other social disadvantage often do not get access to the high-quality education programs needed to counteract these adverse social effects (Boocock 1995; Elliot 2006; Rosenberg et al. 2008).

Quality and accessibility of early childhood education and care

The quality of early childhood education and care is increasingly important due to the rising number of children being cared for outside their homes, and the increase in the average time children spend in non-parental care. However, defining and measuring quality is not straightforward. Establishing which aspects of care quality are critical for children's

outcomes, and the applicability of quality measures across different care settings is complex. Early childhood education and care settings can include long day care centres, family day care services, outside school hours services, care provided by relatives or friends, or Indigenous services (NCAC 2007).

Maternal employment is the primary reason for, and strongest predictor of, use of early childhood services, and the provision of these services is also of critical importance in ensuring children are entering school with the basic skills for life and learning. However, research on the associated risks and/or benefits of early attendance in early childhood education and care settings is mixed. Children's experiences in early childhood education and care affect their development, but the effects are also dependent on factors such as the child's home environment, age, temperament and stability of care. Outcomes specifically related to early childhood education and care experiences appear to be determined by the interplay of interactions with caregivers and other children, as well as the quality, quantity, and type of care (Belsky et al. 2007; Buckingham 2007; COAG 2006; Colwell 2001; Harrison 2008; Hill et al. 2005; NICHD Early Child Care Research Network 2005).

Common structural indicators of quality (that is, those that are independent of human interaction and can be easily regulated) include group size, staff qualifications, staff wages, staff turnover, child–staff ratio, program structure, materials and equipment, schedules, procedures, rules, and guidelines. Common process indicators of quality (that is, those that require human interaction) relate to positive adult–child interactions, parent–staff communication, personal care routines, interactions among children, staff interaction and cooperation, supervision and evaluation of staff, discipline, and general supervision of children. Of the structural indicators, child-to-staff ratios, qualified staff, group size and staff wages appear to be the strongest indicators that measure quality. All structural factors, however, affect the quality of interactions that can occur (AIHW 2009b; Cassidy et al. 2005; Sosinsky et al. 2007).

High-quality child care can be beneficial to a child's cognitive, socio-emotional and physical development, and benefits may be particularly significant among economically disadvantaged children. High-quality early childhood education and care may reduce the adverse effects of low family economic status on school achievement. Positive effects on families may also occur when social and economic benefits accrue where parents have opportunities for employment and increased social interactions. However, very early full-time or high-intensity care can have negative effects on children's development, while entry to child care in the second and third year can produce positive outcomes. Increased hours, exposure to low-quality care, or multiple care arrangements can be detrimental to outcomes. Higher-quality early childhood education and care, however, appears to reduce some of the negative effects of longer hours of early childhood education and care (Belsky et al. 2007; Bernal 2008; Campbell et al. 2002; Cassells et al. 2005; Dearing et al. 2009; Elliot 2006; Gregg et al. 2005; Han et al. 2001; Harrison 2008; Hill et al. 2005; James-Burdumy 2005; Love et al. 2003; Reynolds 2000; Waldfogel et al. 2002).

Access barriers to early childhood education and care are significant. Places are in high demand, and waiting lists can be extensive. The cost and availability of early childhood education and care often acts as a barrier, particularly for lower-income families, who have the most to gain from high-quality care. In addition, disadvantaged children with the most acute socio-emotional needs, such as those vulnerable to mental health problems, may be most likely to be excluded from early childhood education and care. Parental considerations in early childhood education and care use include convenience, cost, program standards, curriculum, teacher qualifications and training, parent-teacher interactions, safety, health,

and the physical environment (Campbell et al. 2002; Cassidy et al. 2005; Dearing et al. 2009; Jang 2009; Kordt-Thomas 2007; Lippman et al. 2008).

Appendix 4: Children's Headline Indicators

In 2005, the Australian Health Ministers' Conference and the Community and Disability Services Ministers' Conference approved a project to develop a set of national, jurisdictionally agreed, Children's Headline Indicators to help policy and planning.

In 2006, the project report *Headline indicators for children's health, development and wellbeing* (Vic DHS 2008) mapped out 19 priority areas for children's health, development and wellbeing (Table A4.1). These priority areas were endorsed by the Australian Health Ministers' Conference, the Community and Disability Services Ministers' Conference, and the then Australian Education Systems Officials Committee of the then Ministerial Council on Education, Employment and Training and Youth Affairs.

The Children's Headline Indicators are designed to focus government policy attention on identified priorities for children's health, development and wellbeing. This will be done by comparing state and territory data, and data from subpopulations of children, including Aboriginal and Torres Strait Islander children, children living in remote and disadvantaged areas, and children from culturally and linguistic diverse backgrounds. The Children's Headline indicators are not intended to provide detailed knowledge about the cause of specific improvements. They are a mechanism to help guide and evaluate policy development, by measuring progress on a set of indicators that are potentially amenable to change over time by prevention or early intervention (Vic DHS 2008).

The guiding principles for the selection of the priority areas for the Children's Headline Indicators included whether the indicator is:

- worth measuring; that is, whether it reflects how Australian children were faring for a broad conceptual issue
- relevant to current Australian and state/territory government policy agendas
- sensitive to intervention and amenable to change
- clear in meaning and interpretation, and based on sound empirical evidence
- able to be reported using data collected, analysed and reported in a statistically reliable and valid way, and measured consistently and repeatedly over time
- capable of reflecting differences and diversity.

Table A4.1: Headline Indicators for children's health, development and wellbeing

Priority areas	Headline Indicators	Data source
Infant mortality	Mortality rate for infants less than 1 year of age	AIHW National Mortality Database
Dental health	Mean number of decayed, missing or filled teeth (DMFT) among primary school children aged 12 years	Child Dental Health Survey
Literacy	Proportion of children in Year 5 achieving at or above the national minimum standards for reading	National Assessment Program—Literacy and Numeracy
Numeracy	Proportion of children in Year 5 achieving at or above the national minimum standards for numeracy	National Assessment Program—Literacy and Numeracy
Teenage births	Age-specific birth rate for 15 to 19 year old women	National Perinatal Data Collection
Birthweight	Proportion of live born infants of low birthweight	National Perinatal Data Collection
Family economic situation	Average real equivalised disposable household income for households with children in the second and third income deciles	ABS Survey of Income and Housing
Injuries	Age-specific death rates from all injuries for children aged 0–4, 5–9 and 10–14 years	AIHW National Mortality Database
Child abuse and neglect	Rate of children aged 0–12 who were the subject of child protection substantiation in a given year	AIHW Child Protection Data Collection
Immunisation	Proportion of children on the Australian Childhood Immunisation Register who are fully immunised at 2 years of age	Australian Childhood Immunisation Register
Overweight and obesity	Proportion of children whose body mass index (BMI) score is above the international cut-off points for 'overweight' and 'obese' for their age and sex	ABS National Health Survey
Transition to primary school	Proportion of children entering school with basic skills for life and learning (under development)	Australian Early Development Index
Attendance at primary school	Attendance rate of children at primary school	Ministerial Council for Education, Early Childhood Development and Youth Affairs National Report on Schooling in Australia—data not currently suitable for reporting
Smoking in pregnancy	Proportion of women who smoked during the first 20 weeks of pregnancy	National data not available
Breastfeeding	Proportion of infants exclusively breastfed at 4 months of age	National data not available
Attending early childhood education programs	Proportion of children attending an early education program in the 2 years before beginning primary school	National data not available
Social and emotional wellbeing	*Indicator under development*	—
Shelter	*Indicator under development*	—
Family social network	*Indicator under development*	—

Relationship between the Headline Indicators and other national reporting frameworks

There are a range of frameworks in Australia that have been developed to monitor early childhood development outcomes, including national reporting on indicator-based frameworks and jurisdictional data collections. Those with particular relevance at the national level to the Early Childhood Development Outcomes Framework are *A picture of Australia's children* and the *Headline indicators for children's health, development and wellbeing*.

The relationship between the Children's Headline Indicators, *A Picture of Australia's Children* and jurisdictional data collections are presented in Figure A4.1. The Children's Headline Indicators are at the top of the figure, as they are a high-level set of measures designed to focus policy attention and help guide and evaluate policy development on key issues for children's health, development and wellbeing in 19 priority areas. Underneath the Headline Indicators are a broader set of indicators that measure the health, development and wellbeing of Australia's children. This is a more comprehensive set of key indicators (56 indicators), covering a much broader range of areas, such as health status and outcomes, risk and protective factors influencing health and wellbeing, early learning and education, family and community environments, safety and security and system performance. The age range (0–14 years) is also broader than the 0-12 years in Children's Headline Indicators (AIHW 2009c).

Underpinning the Headline Indicators and *A picture of Australia's children* is the national and jurisdictional data collection systems, which are even broader still. They are specific to each state and territory and include an even greater number of indicators, reflecting local-level issues (for example the Victorian Child and Adolescent Monitoring System). Many of these data collection systems may be funded by state and territory or Commonwealth agencies and/or are collected at the state, territory or national level (Victorian Department of Education and Early Childhood Development 2009).

More recently the Council of Australian Governments has released a National Early Childhood Development Strategy and National Framework for Protecting Australia's Children, thereby, further expanding the range of indicators available for measuring children's wellbeing.

There is a large overlap in the indicators measuring children's health, development and wellbeing between these different indicator frameworks and reporting mechanisms. Each of these indicator frameworks have a specific set of indicators relating to the area of interest, but many of these indicators overlap, and there are a small set of indicators that are common to all frameworks. For example of the 56 indicators in *A Picture of Australia's Children,* 19 of these are the Children's Headline Indicators, and similarly of the 20 potential indicators for reporting against the ECD Outcomes Framework 12 of these are the Children's Headline Indicators.

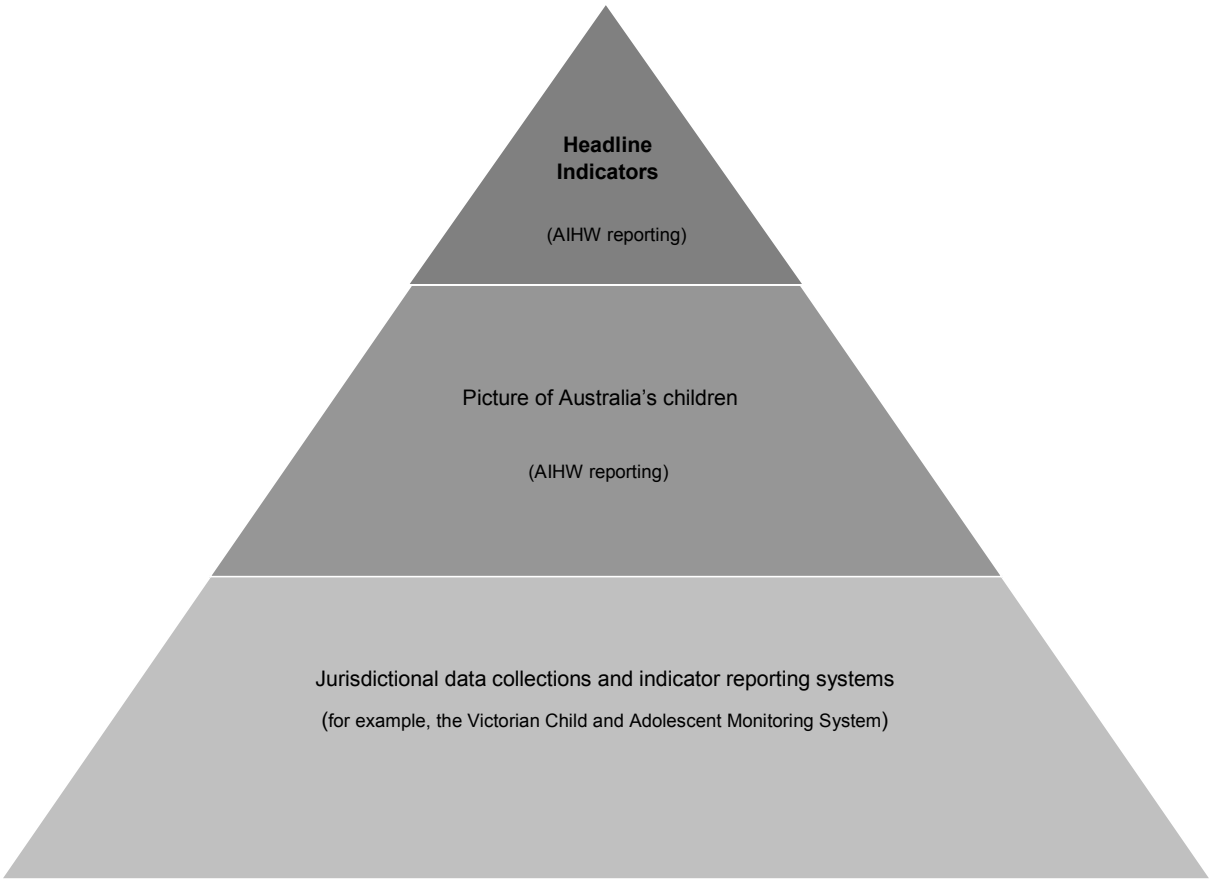


Figure A4.1: Relationship between Headline Indicators and other national reporting frameworks

Appendix 5: Summary of use of conceptual models

Table A5.1: Association between all indicator areas across the seven early childhood development outcome areas

	Outcome 1															Outcome 2											Outcome 3					Outcome 4				Outcome 5			Outcome 6						Outcome 7		
	Alcohol and drug use in pregnancy	Antenatal care	Birthweight	Breastfeeding	Chronic conditions	Dental health	Developmental checks	Immunisation	Mental health	Mortality	Nutrition	Overweight and obesity	Physical activity	Preventable hospitalisations	Smoking in pregnancy	Child abuse and neglect	Children as victims of violence	Electronic media	Environment	Environmental tobacco smoke	Injuries	Neighbourhood	Parental substance use	Peer relationships	Shelter	Attending early childhood education programs	Early learning (home-based)	Parental involvement in education	Social and emotional wellbeing	Transition to primary school	Access to services	Family economic situation	Parental education	Parental employment	Literacy and numeracy	School attendance	School engagement	Early intervention services	Family functioning	Family social network	Parental and family health	Parenting quality	Teenage births	Accessibility of early childhood services	Affordability of early childhood services	Quality of early childhood service
Outcome 1																																													
Alcohol and drug use in pregnancy		✓	✓	✓	✓				✓	✓		•			✓								✓										✓									✓			
Antenatal care	✓		✓							✓					✓								✓							✓	•	✓							•			✓			
Birthweight	✓	✓			✓					✓		✓			✓									•					•	✓	•	✓		•		✓			•		✓			
Breastfeeding	✓				✓	✓				✓		✓		✓	✓															✓	•	✓		•							✓			
Chronic conditions	✓		✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓				✓	✓				•	✓			•		✓				•	✓		•	•	•			✓			
Dental health				✓	✓						✓	✓												•				•		•	•	✓			•							•			
Developmental checks					✓																													•			•								
Immunisation					✓					✓				✓																✓																
Mental health	✓				✓							✓	✓		✓	✓	✓		✓	•	✓	✓	✓	✓	✓				✓	✓	✓	✓		✓	•		✓	•	✓	✓	✓		✓			✓
Mortality	✓	✓	✓	✓				✓			✓			✓	✓	✓	✓		•		✓	•	✓								•	•	✓										✓			
Nutrition					✓	✓				✓		✓	✓	✓				✓													✓				✓							✓			
Overweight and obesity	✓		✓	✓	✓	✓			✓		✓		✓		✓			✓	✓				✓		✓						•				•			•			•	•			
Physical activity					✓				✓		✓	✓						✓																											
Preventable hospitalisations				✓	✓			✓		✓	✓								✓												✓							•							
Smoking in pregnancy	•	✓	✓	✓	✓				✓	✓		✓																				•		•								✓			
Outcome 2																																													
Child abuse and neglect									✓	•									✓	✓								•		✓	•		✓	•			•			•	•	✓			
Children as victims of violence									•	•									✓		✓							•						•				✓	✓		✓				
Electronic media											•	✓	•								✓							•						•										
Environment					•				•	✓		•							✓						✓						✓														
Environmental tobacco smoke					•																		✓		✓										•									
Injuries									✓	•				•					✓				✓	✓							✓						✓				•			

(continued)

Table A5.1 (continued): Association between all indicator areas across the seven early childhood development outcome areas

	Outcome 1														Outcome 2											Outcome 3					Outcome 4				Outcome 5			Outcome 6						Outcome 7		
	Alcohol and drug use in pregnancy	Antenatal care	Birthweight	Breastfeeding	Chronic conditions	Dental health	Developmental checks	Immunisation	Mental health	Mortality	Nutrition	Overweight and obesity	Physical activity	Preventable hospitalisations	Smoking in pregnancy	Child abuse and neglect	Children as victims of violence	Electronic Media	Environment	Environmental tobacco Smoke	Injuries	Neighbourhood	Parental substance use	Peer relationships	Shelter	Attending early childhood education programs	Early learning (home-based)	Parental involvement in education	Social and emotional wellbeing	Transition to primary school	Access to services	Family economic situation	Parental education	Parental employment	Literacy and numeracy	School attendance	School engagement	Early intervention services	Family functioning	Family social network	Parental and family health	Parenting quality	Teenage births	Accessibility of early childhood services	Affordability of early childhood services	Quality of early childhood service
Neighbourhood									●	✓		●				✓	✓				✓			✓	✓					✓			✓	✓		●				✓					✓		✓
Parental substance use		●							●	●						✓				✓	✓	✓			✓			●	●			●		●				●	●	✓	●				
Peer relationships			✓		✓	✓			✓			✓					✓	✓			✓	✓							✓		✓			●	●	✓		✓	✓		✓				
Shelter					●				●										✓	●		✓	✓		✓			●	✓		✓	✓		●	●		✓				✓	✓			
Outcome 3																																													
Attending education programs																								●				✓	✓		●	●		●			●								
Early learning (home-based)																													✓		●	✓		●				●			✓				
Parental involvement in education																							✓					✓	✓		●	✓		●							●				
Social and emotional wellbeing			✓		✓	✓			✓			✓	✓			✓	✓	✓					✓	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Transition to primary school									●													●		●	✓	✓	✓	✓		●	●	●		●			✓			●		●			✓
Outcome 4																																													
Access to services		✓	●	✓	✓	✓		●	✓	✓				✓		●													●	✓		✓		●			✓		✓	✓	✓	✓		●	
Family economic situation		✓	✓	✓		✓			✓	✓	●	✓				✓		●		✓	●	✓	●	●	✓	✓	✓	●	✓	●			✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
Parental education	●	✓	●	✓		✓				✓					✓						●			●	✓	✓	✓		✓				●	✓		✓		✓	●	✓	●				
Parental employment									●							●													●		✓	✓		✓			●		●		●	✓			
Outcome 5																																													
Literacy and numeracy			✓	✓	✓		✓		✓					✓		✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓				✓	✓	✓			✓
School attendance					●	✓					●								✓					✓					✓					✓		✓									
School engagement																								●					✓		●	✓			✓	✓		✓			●	✓			
Outcome 6																																													
Early intervention services			✓		✓		✓		●			✓		✓		✓				●				●	✓				●	●	✓									✓					
Family functioning					✓				✓								●						✓	●		✓			✓			✓	✓	✓			●			✓	✓	✓	✓		✓
Family social network		✓			✓				●							✓	●					✓	✓	●					●	✓	✓						✓	✓			✓	✓			✓
Parental and family health			✓						✓			✓				✓							✓						●	✓	●		✓					✓			✓				
Parenting quality									✓		✓	✓					●				✓		✓	●	●		✓	✓	✓		●	✓	✓		✓		✓		✓	✓	✓		✓			
Teenage births	●	✓	●		●	✓				✓				✓	✓									●				✓	●	✓	✓	✓	●	✓			✓	✓	✓						✓

(continued)

Table 5.1 (continued): Association between all indicator areas across the seven early childhood development outcome areas

	Outcome 1															Outcome 2											Outcome 3					Outcome 4				Outcome 5			Outcome 6						Outcome 7		
	Alcohol and drug use in pregnancy	Antenatal care	Birthweight	Breastfeeding	Chronic conditions	Dental health	Developmental checks	Immunisation	Mental health	Mortality	Nutrition	Overweight and obesity	Physical activity	Preventable hospitalisations	Smoking in pregnancy	Child abuse and neglect	Children as victims of violence	Electronic Media	Environment	Environmental tobacco Smoke	Injuries	Neighbourhood	Parental substance use	Peer relationships	Shelter	Attending early childhood education programs	Early learning (home-based)	Parental involvement in education	Social and emotional wellbeing	Transition to primary school	Access to services	Family economic situation	Parental education	Parental employment	Literacy and numeracy	School attendance	School engagement	Early intervention services	Family functioning	Family social network	Parental and family health	Parenting quality	Teenage births	Accessibility of early childhood services	Affordability of early childhood services	Quality of early childhood service
Outcome 7																																														
Accessibility of early childhood services									•													•										•		•										✓	✓
Affordability of early childhood services																														✓	✓												✓		✓
Quality of early childhood service																						✓						•	✓		•		•				•	•			•	✓	✓	
Column count	*7*	*9*	*12*	*11*	*19*	*11*	*3*	*3*	*15*	*14*	*7*	*15*	*5*	*7*	*11*	*11*	*6*	*6*	*5*	*3*	*8*	*11*	*16*	*8*	*9*	*7*	*6*	*6*	*10*	*14*	*13*	*15*	*17*	*7*	*6*	*5*	*8*	*8*	*10*	*11*	*9*	*13*	*15*	*6*	*3*	*10*
Additional row count[(a)]	*2*	*4*	*4*	*2*	*6*	*1*	*0*	*1*	*17*	*6*	*3*	*3*	*1*	*2*	*1*	*4*	*3*	*1*	*2*	*0*	*2*	*7*	*1*	*11*	*7*	*0*	*2*	*2*	*24*	*2*	*13*	*24*	*13*	*1*	*25*	*5*	*4*	*8*	*9*	*8*	*8*	*12*	*11*	*0*	*2*	*2*
Total count	**9**	**13**	**16**	**13**	**25**	**12**	**3**	**4**	**32**	**20**	**10**	**18**	**6**	**9**	**12**	**15**	**9**	**7**	**7**	**3**	**10**	**18**	**17**	**19**	**16**	**7**	**8**	**8**	**34**	**16**	**26**	**39**	**30**	**8**	**31**	**10**	**12**	**16**	**19**	**19**	**17**	**25**	**26**	**6**	**5**	**12**
Overall ranking	**17**	**15**	**12**	**14**	**7**	**14**	**23**	**22**	**3**	**8**	**16**	**10**	**20**	**17**	**15**	**13**	**17**	**19**	**19**	**23**	**16**	**11**	**10**	**9**	**12**	**18**	**18**	**19**	**2**	**12**	**6**	**1**	**5**	**18**	**4**	**15**	**16**	**11**	**9**	**9**	**12**	**7**	**6**	**20**	**21**	**15**

(a) Count does not include ticks with links to other indicators within the same outcome area.

Note: '•' indicates link has been identified by a '✓' in the corresponding area of the matrix due to the association being made in more than one outcome area of the literature review.

Appendix 6: Workshop participants

John Ainley	Australian Council for Educational Research
Russell Ayres	Australian Government Department of Education, Employment and Workplace Relations
Melinda Bromley	Australian Government Department of Health and Ageing
Dan Cloney	University of Melbourne, Research Manager, E4Kids Study
Robert Cummins	Deakin University
Jenny Dean	Australian Government Department of Education, Employment and Workplace Relations
David Engelhardt	South Australian Department of Education and Children's Services (Early Childhood Development Outcomes Steering Group member)
Susan Forbes	Children's Policy Branch, Australian Government Department of Family, Housing, Community Services, and Indigenous Affairs
Sharon Goldfeld	Centre for Community Child Health, Royal Children's Hospital Melbourne
Linda Harrison	Charles Sturt University
Alan Herning	Australian Bureau of Statistics, Director, National Centre for Education and Training Statistics, administrative data area
Diana Hetzel	University of Adelaide
Geoff Holloway	Australian Research Alliance for Children and Youth
Ngaire Hosking	Australian Government Department of Education, Employment and Workplace Relations
Mark Lang	Australian Government Department of Education, Employment and Workplace Relations
Sushma Mathur	Australian Institute of Health and Welfare
Bernie Morris	Australian Government Department of Health and Ageing
George Patton (Chair)	Royal Children's Hospital, University of Melbourne
Melinda Petrie	Australian Institute of Health and Welfare
Naomi Priest	University of Melbourne
Jenny Proimos	Victorian Government Department of Education and Early Childhood Development
Michelle Quee	Australian Institute of Health and Welfare
Gerry Redmond	Social Policy Research Centre, University of New South Wales
Mary Beneforti (Secretariat)	Australian Institute of Health and Welfare

References

ABS (Australian Bureau of Statistics) 1999. Disability, ageing and carers, Australia: summary of findings 1998. ABS cat. no. 4430.0. Canberra: ABS.

ABS 2006a. Measures of Australia's progress. ABS cat. no. 1370.0. Canberra: ABS.

ABS 2006b. National Health Survey 2004–05: summary of results. ABS cat. no. 4364.0. Canberra: ABS. Canberra: ABS. Viewed 27 June 2008, <www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4364.02004-05?OpenDocument>.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2005. ABS cat. no. 4704.0. AIHW cat. no. IHW 14. Canberra: ABS & AIHW.

ACAM (Australian Centre for Asthma Monitoring) 2009. Asthma in Australian Children: findings from *Growing Up in Australia*, the Longitudinal Study of Australian Children. Cat. no. ACM 17. Canberra: AIHW.

Acevedo-Garcia D, Soobader M & Berkman L 2007. Low birthweight among US Hispanic/Latino subgroups: the effect of maternal foreign-born status and education. Social Science & Medicine 65:2503–16.

Adermann J & Campbell M 2008. Indigenous youth reaching their potential: making the connection between anxiety and school attendance and retention rates. In Proceedings Australian Association of Research in Education 2008, Brisbane.

AHMAC (Australian Health Ministers' Advisory Council) 2008. Aboriginal and Torres Strait Islander Health Performance Framework report 2008. Canberra: AHMAC.

Ahmed E & Braithwaite V 2004. Bullying and victimization: cause for concern for both families and schools. Social Psychology of Education 7:35–54.

AIC (Australian Institute of Criminology): Johnson H 2005. Crime victimisation in Australia: key results of the 2004 International Crime Victimisation Survey. Research and public policy series no. 64. Canberra: AIC.

AICAFMHA (Australian Infant, Child, Adolescent and Family Mental Health Association) 2001. Children of parents affected by mental illness: a scoping project. Stepney: AICAFMHA.

AIHW 2004a. Children with disabilities in Australia. Cat. no. DIS 38. Canberra: AIHW.

AIHW 2004b. Heart, stroke and vascular diseases—Australian facts 2004. Cardiovascular disease series no. 22. Cat. no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia.

AIHW 2005. A picture of Australia's children. Cat. no. PHE 58. Canberra: AIHW.

AIHW 2007. Australia's welfare 2007. Cat. no. AUS 93. Canberra: AIHW.

AIHW 2008a. Australia's health 2008. Cat. no. AUS 99. Canberra: AIHW.

AIHW 2008b. Key national indicators of children's health, development and wellbeing: indicator framework for A picture of Australia's children 2009. Cat. no. AUS 100. Canberra: AIHW.

AIHW 2009a. Aboriginal and Torres Strait Islander Health Performance Framework, 2008 report: Detailed analyses. Cat. no. IHW 22. Canberra: AIHW.

AIHW 2009b. Funding sources for admitted patients in Australian hospitals, 2005–06. Health and welfare expenditure series no. 39. Cat. no. HWE 44. Canberra: AIHW.

AIHW 2009c. A picture of Australia's children 2009. Cat. no. PHE 112. Canberra: AIHW.

AIHW 2010a. Family social network: development of a Children's Headline Indicator. Cat. no. PHE 131. Canberra: AIHW.

AIHW 2010b. Health and wellbeing of young Australians: indicator framework and key national indicators. Bulletin no.77. Cat. no. AUS 123. Canberra: AIHW.

AIHW 2011 (forthcoming). Social and emotional wellbeing: development of a Children's Headline Indicator. Canberra: AIHW.

AIHW: Ford J, Nassar N, Sullivan E, Chambers G & Lancaster P 2003. Reproductive health indicators, Australia 2002. AIHW cat. no. PER 20. Canberra: AIHW National Perinatal Statistics Unit.

AIHW: Laws P, Abeywardana S, Walker J & Sullivan E 2007. Australia's mothers and babies 2005. Perinatal statistics series no. 20. Cat. no. PER 40. Sydney: AIHW National Perinatal Statistics Unit.

AIHW: Laws P, Grayson N & Sullivan E 2004. Australia's mothers and babies 2004. Perinatal statistics series no. 18. Cat. no. PER 34. Sydney: AIHW National Perinatal Statistics Unit.

Ainsworth F 2004. Drug use by parents: the challenge for child protection and drug and alcohol services. Children Australia 29:4–10.

Alexander K, Entwisle D & Horsey C 1997. From first grade forward: early foundations of high school dropout. Sociology of Education 70:87–107.

Aliyu M, Salihu H, Wilson R & Kirby R 2007. Prenatal smoking and risk of intrapartum stillbirth. Archives of Environmental and Occupational Health 62:87.

Allison S, Roeger L & Abbot D 2008. Overcoming barriers in referral from schools to mental health services. Australian and New Zealand Journal of Psychiatry 16:44–7.

Amato P & Rivera F 1999. Paternal involvement and children's behavior problems. Journal of Marriage and the Family 61:375–84.

Andersen L, Harro M, Sardinha L, Froberg K, Ekelund U, Brage S et al. 2006. Physical activity and clustered cardiovascular risk in children: a cross-sectional study (The European Youth Heart Study). The Lancet 368:299–304.

Andre F, Booy R, Bock H, Clemens J, Datta S, John T et al. 2008. Vaccination greatly reduces disease, disability, death and inequity worldwide. Bulletin of the World Health Organization 86:140.

APA (American Psychiatric Association) 1994. Diagnostic and statistical manual of mental disorders (DSM IV), 4th edition. Washington, DC: APA.

Arboleda-Florez J & Wade T 2001. Childhood and adult victimisation as risk factor for major depression. International Journal of Law and Psychiatry 24:357–70.

Arnold D, Zeljo A, Doctoroff G & Ortiz C 2008. Parent involvement in preschool: predictors and the relation of involvement to preliteracy development. School Psychology Review 37:74.

Arntzen A, Magnus P & Bakketeig L 2008. Different effects of maternal and paternal education on early mortality in Norway. Paediatric and Perinatal Epidemiology 7:376–86.

Baer J, Sampson P, Barr H, Connor P & Streissguth A 2003. A 21-year longitudinal analysis of the effects of prenatal alcohol exposure on young adult drinking. Archives of General Psychiatry 60:377.

Bailie R, Si D, Dowden M, Selvey C, Kennedy C, Cox R et al. 2009. A systems approach to improving timeliness of immunisation. Vaccine 27:3669–3674.

Barkmann C, Romer G, Watson M & Schulte-Markwort M 2007. Parental physical illness as a risk for psychosocial maladjustment in children and adolescents: epidemiological findings from a national survey in Germany. Psychosomatics 48:476–9.

Barnett M 2008. Economic disadvantage in complex family systems: expansion of family stress models. Clinical Child and Family Psychology Review 11:145–61.

Barnett W 1995. Long-term effects of early childhood programs on cognitive and school outcomes. The Future of Children 5:25–50.

Bell A, Corfield M, Davies J & Richardson N 2010. Collaborative transdisciplinary intervention in early years—putting theory into practice. Child Care, Health and Development 36:142.

Belsky J, Burchinal M, McCartney K, Vandell D, Clarke-Stewart K & Owen M 2007. Are there long-term effects of early child care? Child Development 78:681.

Benton D 2004. Role of parents in the determination of the food preferences of children and the development of obesity. International Journal of Obesity 28:858–69.

Berg P & Coniglio D 2006. Oral health in children overlooked and undertreated. Journal of the American Academy of Physician Assistants 19:40–52.

Bernal R 2008. The effect of maternal employment and child care on children's cognitive development. International Economic Review 49:1173.

Bernard ME, Stephanou A & Urbach D 2007. Australian Scholarship Group Student Social and Emotional Health Report, October 2007. A research project conducted by Australian Council for Educational Research. Melbourne: Australian Scholarship Group.

Berry JG, Jamieson LM & Harrison JE 2010. Head and traumatic brain injuries among Australian children, July 2000–June 2006. Injury Prevention 16:198–202.

Berthelsen D & Walker S 2007. Parent involvement and children's early learning competence in literacy and mathematical understanding and approaches to learning. In Proceedings Longitudinal Study of Australian Children Research Conference, Melbourne.

Bhatia SK & Bhatia SC B 2007. Childhood and adolescent depression. American Family Physician 75:73–80.

Bhutta Z, Darmstadt G, Haws R, Yakoob M & Lawn J 2009. Delivering interventions to reduce the global burden of stillbirths: improving service supply and community demand. BioMed Central Pregnancy and Childbirth 9:S7.

Biedlinger N 2009. Early ethnic inequality: the influence of social background and parental involvement on preschool children's cognitive ability in Germany. Viewed 8 January 2010, <www.springerlink.com/content/tp2p216613k332m5/fulltext.pdf>.

Binns C, Gilchrist D, Gracey M, Zhang M, Scott J & Lee A 2004. Factors associated with the initiation of breast-feeding by Aboriginal mothers in Perth. Public Health Nutrition 7:857–61.

Birch S & Ladd G 1997. The teacher–child relationship and children's early school adjustment. Journal of School Psychology 35:61–79.

Birken C, Parkin P, To T & Macarthur C 2006. Trends in rates of death from unintentional injury among Canadian children in urban areas: influence of socioeconomic status. Canadian Medical Association Journal 175:867.

Blackman J 2003. Early intervention: an overview. In: Odom S, Hanson MJ, Blackman JA, Kaul S (ed.). Early intervention practices around the world. Baltimore: Brookes Publishing.

Bodenheimer T, Wagner E & Grumbach K 2002. Improving primary care for patients with chronic illness: the chronic care model, Part 2. Journal of the American Medical Association 288:1909–14.

Boocock S 1995. Early childhood programs in other nations: goals and outcomes. The Future of Children 5:94–114.

Boyd J, Barnett W, Bodrova E, Leong D, Gomby D, Robin K et al. 2005. Promoting children's social and emotional development through preschool. National Institute for Early Education policy report (March 2005). New Brunswick, New Jersey: NIEER, Rutgers University.

Boyle M, Racine Y, Georgiades K, Snelling D, Hong S, Omariba W et al. 2006. The influence of economic development level, household wealth and maternal education on child health in the developing world. Social Science & Medicine 63:2242–54.

Bradshaw J & Richardson D 2009. An index of child well-being in Europe. Child Indicators Research 2:319–51.

Brameld K, Holman D & Moorin R 2006. Possession of health insurance in Australia: how does it affect hospital use and outcomes? Journal of Health Services Research & Policy 11:94.

Braveman P, Sadegh-Nobari T & Egerter S 2008. Early childhood experiences: laying the foundation for health across a lifetime. Princeton NJ: Robert Wood Johnson Foundation.

Brody G & Flor D 1998. Maternal resources, parenting practices, and child competence in rural, single-parent African American families. Child Development 69:803–16.

Bromfield L & Higgins D 2005. National comparisons of child protection systems. Child Abuse Prevention Issues No. 22. Melbourne: Australian Institute of Family Studies.

Bromfield L & Holzer P 2008. Australian Institute of Family Studies submission to the special commission of inquiry into child protection in NSW. Melbourne: Australian Institute of Family Studies.

Bronfenbrenner U 1979. The ecology of human development: experiments by nature and design. Cambridge, MA: Harvard University Press.

Bronfenbrenner U 1995. Developmental ecology through space and time: a future perspective. In: Moen P, Elder GH, Jr. & Lüscher K (eds). Examining lives in context: perspectives on the ecology of human development. Washington D.C.: American Psychological Association, 619–47.

Brooks-Gunn J 1995. Children in families in communities: risk and intervention in the Bronfenbrenner tradition. In: Moen P, Elder Jr GH & Lüscher K (eds). Examining lives in context: perspectives on the ecology of human development. Washington, DC: American Psychological Association 467–519.

Bruder MA 2010. Early childhood intervention: a promise to children and families for their future. Exceptional Children 76:339.

Buckingham J 2007. Child care: who benefits? Issues analysis no. 89. Sydney: The Centre for Independent Studies.

Buhs E & Ladd G 2001. Peer rejection as antecedent of young children's school adjustment: An examination of mediating processes. Developmental Psychology 37:550–60.

Burchinal P, Kainz K, Cai K, Tout K, Zaslow M & Martinez-Beck I 2009. Early care and education quality and child outcomes. Washington, DC: Office of Planning, Research and Evaluation. Viewed 28 May 2008, <www.childtrends.org/Files//Child_Trends-2009_5_21_RB_earlycare.pdf>.

Campbell F, Ramey C, Pungello E, Sparling J & Miller-Johnson S 2002. Early childhood education: young adult outcomes from the Abecedarian Project. Applied Developmental Science 6:42–57.

Canadian Council on Social Development 2006. The progress of Canada's children and youth 2006. Canada: Canadian Council on Social Development.

Carers Australia 2001. Young carers research project: final report. Viewed 28 May 2008, <www.fahcsia.gov.au/sa/carers/pubs/YoungCarersReport/Pages/default.aspx>.

Carson B, Dunbar T, Chenhall R & Bailie R (eds) 2007. Social determinants of Indigenous health. Sydney: Allen & Unwin.

Cashmore JA & Paxman M 1996. Wards leaving care: a longitudinal study. Sydney: Department of Community Services.

Cassells R, Macnamara J, Lloyd R & Harding A 2005. Perceptions of child care affordability and availability in Australia: what the Household, Income and Labour Dynamics in Australia survey tells us. Melbourne: Paper presented at the Ninth Australian Institute of Family Studies Conference.

Cassen R & Kingdon G 2007. Tackling low educational achievement. York, UK: Joseph Rowntree Foundation.

Cassidy D, Hestenes L, Hansen J, Hegde A, Shim J & Hestenes S 2005. Revisiting the two faces of child care quality: structure and process. Early Education and Development 16:505–20.

CDC (Center for Disease Control and Prevention) 2007. Exposure to secondhand smoke among students aged 13–15 years—worldwide, 2000–2007. Morbidity and Mortality Weekly Report 56:497–500.

CEHSEU (Clinical Epidemiology & Health Service Evaluation Unit) 2009. Potentially preventable hospitalisations: a review of the literature and Australian policies. Melbourne: CEHSEU.

Chaffin M, Kelleher K & Hollenberg J 1996. Onset of physical abuse and neglect: psychiatric, substance abuse, and social risk factors from prospective community data. Child Abuse and Neglect 20:191–204.

Chan D & Sullivan E 2008. Teenage smoking in pregnancy and birthweight: a population study, 2001–2004. Medical Journal of Australia 188:392–6.

Chen X, Wen S, Fleming N, Yang Q & Walker M 2007. Teenage pregnancy and congenital anomalies: which system is vulnerable? Human Reproduction 22:1730–5.

Chomitz V, Cheung L & Lieberman E 1995. The role of lifestyle in preventing low birth weight. The Future of Children 5:121–38.

Chong J, Craig M, Cameron F, Clarke C, Rodda C, Donath S et al. 2007. Marked increase in Type 1 diabetes mellitus incidence in children aged 0–14 yr in Victoria, Australia, from 1999 to 2002. Pediatric Diabetes 8:67–73.

Christakis D, Zimmerman F, DiGiuseppe D & McCarty C 2004. Early television exposure and subsequent attentional problems in children. Pediatrics 113:708.

Christian K, Morrison F & Bryant F 1998. Predicting kindergarten academic skills: interactions among child care, maternal education, and family literacy environments. Early Childhood Research Quarterly 13:501–21.

Clark C & Akerman R 2006. Social inclusion and reading: an exploration. London: National Literacy Trust.

COAG (Council of Australian Governments) 2006. COAG Communique, 10 February 2006. Attachment A: National Reform Agenda: Human capital stream. Canberra: COAG. Viewed 20 October 2009, <www.coag.gov.au/coag_meeting_outcomes/2006-02-10/index.cfm >.

COAG 2009. Investing in the early years—a national early childhood development strategy. An initiative of the Council of Australian Governments. Canberra: COAG. Viewed 12 January 2010, <www.coag.gov.au/coag_meeting_outcomes/2009-07-02/docs/national_ECD_strategy.pdf>.

Coleman JS 1988. Social capital in the creation of human capital. American Journal of Sociology 94:95–120.

Collins W, Maccoby E, Steinberg L, Hetherington E & Bornstein M 2000. Contemporary research on parenting: the case for nature and nurture. American Psychologist 55:218–32.

Colton R 1996. A road oft taken: unaffordable home energy bills, forced mobility and childhood education in Missouri. Journal of Children and Poverty 2:23–40.

Colwell M 2001. Cumulative risk and continuity in nonparental care from infancy to early adolescence. Merrill Palmer Quarterly 47:207.

Commonwealth of Australia 2002. Environmental tobacco smoke in Australia. National Tobacco Strategy 1999 to 2002–03 occasional paper. Canberra: Commonwealth of Australia.

Commonwealth of Australia 2006. Vaccination for our mob. Canberra: Commonwealth of Australia.

Commonwealth of Australia 2008a. Vaccine preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander people, Australia, 2003 to 2006. Canberra: Commonwealth of Australia.

Commonwealth of Australia 2008b. 2007 Australian National Children's Nutrition and Physical Activity Survey: main findings. Canberra: Commonwealth of Australia.

Conde-Agudelo A, Belizán J & Lammers C 2005. Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: Cross-sectional study. American Journal of Obstetrics and Gynecology 192:342–9.

Conners N, Bradley R, Whiteside Mansell L, Liu J, Roberts T, Burgdorf K et al. 2004. Children of mothers with serious substance abuse problems: an accumulation of risks. The American Journal of Drug and Alcohol Abuse 30:85–100.

Considine G & Zappalà G 2002. The influence of social and economic disadvantage in the academic performance of school students in Australia. Journal of Sociology 38:129.

Cooper M 2001. Housing affordability: a children's issue. Ottawa: Canadian Policy Research Networks Inc.

Cripps R & Steel D 2006. Childhood poisoning in Australia. AIHW cat. no. INJCAT 90. Canberra: AIHW.

Croninger R & Lee V 2001. Social capital and dropping out of school: benefits to at-risk students of teachers' support and guidance. Teachers College Record 103:548.

CSIRO 2009. Fact sheet: recreational screen time. Canberra: CSIRO. Viewed 23 February 2009, <www.csiro.au/resources/WellbeingForKids-ScreenTime.html#evidence>.

Culp A, Hubbs-Tait L, Culp R & Starost H 2000. Maternal parenting characteristics and school involvement: predictors of kindergarten cognitive competence among head start children. Journal of Research in Childhood Education 15:5–17.

Curtis J, Dooley D & Phipps A 2004. Child well-being and neighbourhood quality: evidence from the Canadian National Longitudinal Survey of Children and Youth. Social Science and Medicine 58:1917–27.

Dadds M, Maujean A & Fraser J 2003. Parenting and conduct problems in children: Australian data and psychometric properties of the Alabama Parenting Questionnaire. Australian Psychologist 38:238–41.

Daniels L, Magarey A, Battistutta D, Nicholson J, Farrell A, Davidson G et al. 2009. The NOURISH randomised control trial: positive feeding practices and food preferences in early childhood: a primary prevention program for childhood obesity. BMC Public Health 9:387.

Dawe S, Frye S, Best D, Moss D, Atkinson J, Evans C et al. 2006. Drug use in the family: impacts and implications for children. Australian National Council on Drugs research paper no. 13. Canberra: Australian Government Department of Families, Community Services and Indigenous Affairs.

de Maio J, Zubrick S, Silburn S, Lawrence D, Mitrou F, Dalby R et al. 2005. The Western Australian Aboriginal Child Health Survey: Measuring the social and emotional wellbeing of Aboriginal children and intergenerational effects of forced separation. Perth: Curtin University of Technology & Telethon Institute for Child Health Research.

Dearing E, McCartney K & Taylor B 2009. Does higher quality early child care promote low-income children's math and reading achievement in middle childhood? Child Development 80:1329.

DeFrain J 1999. Strong families around the world. Family Matters 53:6–13.

DeGarmo D, Forgatch M & Martinez Jr C 1999. Parenting of divorced mothers as a link between social status and boys' academic outcomes: unpacking the effects of socioeconomic status. Child Development 70:1231–45.

Denham S 2007. Dealing with feelings: how children negotiate the worlds of emotions and social relationships. Cogniție, Creier, Comportament/Cognition, Brain, Behavior XI:1–48.

Denham S, Blair K, DeMulder E, Levitas J, Sawyer K, Auerbach-Major S et al. 2003. Preschool emotional competence: pathway to social competence? Child Development 74:238–56.

Desforges C & Abouchaar A 2003. The impact of parental involvement, parental support and family education on pupil achievement and adjustment: a literature review. Nottingham: Department for Education and Skills.

DEST (Department of Education, Science and Training) 2006. Key information from the literature on bullying. Canberra: DEST. Viewed 26 June 2008, <www.dest.gov.au/NR/rdonlyres/D9BD73D0-FFE3-4D57-B29E-8A44058BA541/1639/ResearchSummary.rtf>.

DEST 2007. Cyber bullying. Viewed 13 March 2009, <www.auburnsthps.vic.edu.au/NewContent/StudentWelfare/documents/Behaviour%20&%20Discipline/Bullying/cyberbullying.pdf>.

DHAC (Department of Health and Aged Care) 2000. Promotion, prevention and early intervention for mental health: a monograph. Canberra: DHAC.

Dockett S & Perry B 2007. The role of schools and communities in children's school transition. Centre of Excellence for Early Childhood Development.

DoHA (Department of Health and Ageing) 2004. Active kids are healthy kids. Australia's physical activity recommendations for 5–12 year olds. Canberra: DoHA. Viewed 20 February 2006, <www.health.gov.au/internet/main/publishing.nsf/content/9D7D393564FA0C42CA256F970014A5D4/$File/kids_phys.pdf>.

DoHA 2009a. Healthy Kids Check provided by a practice nurse or registered Aboriginal health worker. Canberra: DoHA. Viewed 6 July 2010, <www.health.gov.au/internet/main/publishing.nsf/Content/1F03CF3D7D4F1E95CA25771C0019047D/$File/Medicare%20Healthy%20Kids%20Fact%20Sheet%203%20Practice%20Nurse.pdf>.

DoHA 2009b. Promoting healthy weight: about overweight and obesity. Canberra: DoHA. Viewed 6 July 2010, <www.health.gov.au/internet/main/Publishing.nsf/Content/health-pubhlth-strateg-hlthwt-obesity.htm>.

Downe S, Finlayson K, Walsh D & Lavender T 2009. 'Weighing up and balancing out': a metasynthesis of barriers to antenatal care for marginalised women in high-income countries. BJOG: An International Journal of Obstetrics and Gynaecology 116:518–29.

Downer J, Campos R, McWayne C & Gartner T 2008. Father involvement and children's early learning: a critical review of published empirical work from the past 15 years. Marriage & Family Review 43:67.

Drevenstedt G, Crimmins E, Vasunilashorn S & Finch C 2008. The rise and fall of excess male infant mortality. Proceedings of the National Academy of Sciences 105:5016.

Dunlop A 2002. Perspectives on children as learners in the transition to school. In: Fabian H & Dunlop A (eds). Transitions in the early years: debating continuity and progression for young children. London: Routledge Falmer.

Du Prel X, Krämer U, Behrendt H, Ring J, Oppermann H, Schikowski T et al. 2006. Preschool children's health and its association with parental education and individual living conditions in East and West Germany. BMC Public Health 6:312.

Durrant J, Ensom R & and the Coalition on Physical Punishment of Children and Youth 2004. Joint statement on physical punishment of children and youth. Ottawa: Coalition on Physical Punishment of Children and Youth.

Early Childhood Intervention Australia (Victoria) 2007. Promoting excellence in early childhood intervention. Viewed 6 July 2010, <www.eciavic.org.au/professionals/Promoting_Excellence.html>.

Edwards C, Sheridan S & Knoche L 2008. Parent engagement and school readiness: parent-child relationships in early learning. Lincoln: Child, Youth, and Family Studies, Department of Child, Youth, and Family Studies, University of Nebraska.

Eiser C 1997. Effects of chronic illness on children and their families. Advances in Psychiatric Treatment 3:204–20.

Elliot A 2006. Early childhood education: pathways to quality and equity for all children. Australian Education Review no. 50. Melbourne: Australian Council for Educational Research.

England S, Loevinsohn B, Melgaard B, Kou U & Jha P 2001. The evidence base for interventions to reduce mortality from vaccine-preventable diseases in low and middle-income countries. Geneva: Commission for Macroeconomics and Health, WHO.

Entwisle D 1995. The role of schools in sustaining early childhood program benefits. The Future of Children 5:133–44.

Espinosa L 1995. Hispanic parent involvement in early childhood programs. ERIC Digest. Viewed 7 July 2010, <www.ericdigests.org/1996-1/hispanic.htm>.

Evangelou M, Sylva K, Edwards A & Smith T 2008. Supporting parents in promoting early learning: the evaluation of the Early Learning Partnership Project. Research Report DCSF-RR039. London: University of Oxford.

Fagan J & Fantuzzo J 1999. Multirater congruence on the social skills rating system: mother, father, and teacher assessments of urban Head Start children's social competencies. Early Childhood Research Quarterly 14:229–42.

Farrar E, Goldfield S & Moore T 2007. School readiness. Melbourne: Australian Research Alliance for Children and Youth.

Felitti VJ, Anda RF, Nordenberg D, Williamson F, Spitz A, Edwards V et al. 1998. The relationship of adult health status to childhood abuse and household dysfunction. American Journal of Preventive Medicine 14:245–258.

Ferguson K 2006. Social capital and children's wellbeing: a critical synthesis of the international social capital literature. International Journal of Social Welfare 15:2–18.

Fergusson D & Horwood L 2002. Male and female offending trajectories. Development and Psychopathology 14:159–77.

Fernández-Ruiz J, Gómez M, Hernández M, Miguel R & Ramos J 2004. Cannabinoid's and gene expression during brain development. Neurotoxicity Research 6:389–401.

Finn J & Rock D 1997. Academic success among students at risk for school failure. Journal of Applied Psychology 82:221–34.

Fleming J, Mullen P, Sibthorpe B & Bammer G 1999. The long-term impact of childhood sexual abuse in Australian women. Child Abuse and Neglect 23:145–59.

Foorman B, Anthony J, Seals L & Mouzaki A 2002. Language development and emergent literacy in preschool. Seminars in Pediatric Neurology 9:173-184.

Forster D, McLachlan H, Rayner J, Yelland J, Gold L & Rayner S 2008. The early postnatal period: exploring women's views, expectations and experiences of care using focus groups in Victoria, Australia. BMC Pregnancy and Childbirth 8:27.

Fourlanos S, Varney M, Tait B, Morahan G, Honeyman M, Colman P et al. 2008. The rising incidence of Type 1 diabetes is accounted for by cases with lower-risk human leukocyte antigen genotypes. Diabetes Care 31:1546–9.

Fredricks J, Blumenfeld P & Paris A 2004. School engagement: potential of the concept, state of the evidence. Review of Educational Research 74:59.

Freemantle C, Read A, de Klerk N, McAullay D, Anderson I & Stanley F 2006. Patterns, trends, and increasing disparities in mortality for Aboriginal and non-Aboriginal infants born in Western Australia, 1980–2001: population database study. The Lancet 367:1758.

French D & Conrad J 2003. School dropout as predicted by peer rejection and antisocial behavior. Journal of Research on Adolescence 11:225–44.

Friedman B & Basu J 2001. Health insurance, primary care, and preventable hospitalization of children in a large state. The American Journal of Managed Care 7:473.

Fullarton S 2002. Student engagement with school: individual and school-level influences. LSAY research report 27. Camberwell: Australian Council for Educational Research.

Gale E 2002. The rise of childhood type 1 diabetes in the 20th century. Diabetes 51:3353.

Galster C & Santiago M 2006. What's the 'hood got to do with it? Parental perceptions about how neighbourhood mechanisms affect their children. Journal of Urban Affairs 28:201–26.

Garcia-Coll C, Akiba D, Palacios N, Bailey B, Silver R, DiMartino L et al. 2002. Parental involvement in children's education: lessons from three immigrant groups. Parenting 2:303–24.

Garg R, Kauppi C, Lewko J & Urajnik D 2002. A structural model of educational aspirations. Journal of Career Development 29:87–108.

Garzon D 2005. Contributing factors to preschool unintentional injury. Journal of Pediatric Nursing 20:441–7.

Geggie J, DeFrain J, Hitchcock S & Silberberg S 2000. Family strengths research project. Newcastle: Family Action Centre, University of Newcastle.

Genomics & Genetics Weekly editors 2007. Attention deficit hyperactivity disorder: computerized training of working memory is a promising therapeutic strategy in ADHD. Genomics & Genetics Weekly:188.

Gilbert G, Duncan R & Shelton B 2003. Social determinants of tooth loss. Health Services Research 38:1843–62.

Glascoe F & Leew S 2010. Parenting behaviors, perceptions, and psychosocial risk: impacts on young children's development. Pediatrics 125:313–319.

Glaser D 2000. Child abuse and neglect and the brain—a review. The Journal of Child Psychology and Psychiatry and Allied Disciplines 41:97–116.

Goodman R 2001. Children with a chronic illness: the interface of medicine and mental health. Child Study Center letter 5. New York: New York University.

Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B, and the International Child Development Steering Group 2007. Developmental potential in the first 5 years for children in developing countries. Lancet 369:60–70.

Green C, Berkule S, Dreyer B, Fierman A, Huberman H, Klass P et al. 2009. Maternal literacy and associations between education and the cognitive home environment in low-income families. Archives of Pediatrics & Adolescent Medicine 163:832.

Green J, McLaughlin K, Berglund P, Gruber M, Sampson N, Zaslavsky A et al. 2010. Childhood adversities and adult psychiatric disorders in the National Comorbidity Survey Replication I: associations with first onset of DSM-IV disorders. Archives of General Psychiatry 67:113.

Gregg P, Washbrook E, Propper C & Burgess S 2005. The effects of a mother's return to work decision on child development in the UK. The Economic Journal 115:F48–F80.

Griffith J 1997. Student and parent perceptions of school social environment: are they group based? The Elementary School Journal 98:135–50.

Griffiths L, Wolke D, Page A, Horwood J & Avon Longitudinal Study of Parents and Children Study Team 2006. Obesity and bullying: different effects for boys and girls. Archives of Disease in Childhood 91:121–5.

Grolnick W, Benjet C, Kurowski C & Apostoleris N 1997. Predictors of parent involvement in children's schooling. Journal of Educational Psychology 89:538–48.

Gruenert S, Ratnam S & Tsantefski M 2004. The nobody's clients project: identifying and addressing the needs of children with substance dependent parents. Richmond: Odyssey Institute of Studies, Odyssey House Victoria.

Guagliardo M 2004. Spatial accessibility of primary care: concepts, methods and challenges. International Journal of Health Geographics 3:3.

Guo S, Wu W, Chumlea W & Roche A 2002. Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. American journal of Clinical Nutrition 76:653–8.

Guralnick M 2010. Early intervention approaches to enhance the peer-related social competence of young children with developmental delays: a historical perspective. Infants & Young Children 23:73.

Guthrie J & Wigfield A 2000. Engagement and motivation in reading. Handbook of reading research 3:403–22.

Haddow JE, Palomaki GE, Allan WC, Williams JR, Knight GJ, Gagnon J et al. 1999. Maternal thyroid deficiency during pregnancy and subsequent neuropsychological development of the child. New England Journal of Medicine 341:549–555.

Halle T, Forry N, Hair E, Perper K, Wandner L, Wessel J et al. 2009. Disparities in early learning and development: lessons from the Early Childhood Longitudinal Study—Birth Cohort. Washington, DC: Child Trends.

Hallett K & O'Rourke P 2003. Social and behavioural determinants of early childhood caries. Australian Dental Journal 48:27–33.

Han W, Waldfogel J & Brooks-Gunn J 2001. The effects of early maternal employment on later cognitive and behavioral outcomes. Journal of Marriage and the Family 63:336–54.

Hansen C, Neller A, O'Farrell T, van der Pols J, Simpson R & Williams G 2003. Air quality and child health-current evidence and priorities for Australia. Technical report no. 7. Queensland: University of Queensland & University of the Sunshine Coast.

Harrison L 2008. Does child care quality matter? Associations between socio-emotional development and non-parental child care in a representative sample of Australian children. Family Matters 79:14–25.

Haverman R & Wolfe B 1991. Childhood events and circumstances influencing high school completion. Demography 28:133–57.

Haverman R & Wolfe B 1994. Succeeding generations: on the effects of investments in children. New York: Russell Sage Foundation.

Hawley C, Ward A, Magnay A & Long J 2004. Outcomes following childhood head injury: a population study. Journal Neurology, Neurosurgery and Psychiatry 75:737–42.

Hayden-Wade H, Stein R, Ghaderi A, Saelens B, Zabinski M & Wilfey D 2005. Prevalence, characteristics, and correlates of teasing experiences among overweight children vs. Non-overweight peers. Obesity Research 13:1381–92.

Heady B & Verick S 2006. Jobless households: longitudinal analysis of the persistence and determinants of joblessness using Household, Income and Labour Dynamics in Australia Survey data for 2001–03. Melbourne Institute Report no. 7. Melbourne: Melbourne Institute of Applied Economic and Social Research.

Heady B, Warren D & Harding G 2006. Families, incomes and jobs: a statistical report of the Household, Income and Labour Dynamics in Australia Survey. Melbourne: Melbourne Institute of Applied Economic and Social Research.

Heaven P & Newbury K 2004. Relationships between adolescent and parental characteristics and adolescents' attitudes to school and self-rated academic performance. Australian Journal of Psychology 56:173–80.

Hegarty M 2004. Mind the gap—children whose parents have a dual diagnosis. In: Robertson S (ed.) Dancing to the beat of a different drum: book of proceedings, 15th Annual TheMHS Conference, Adelaide, South Australia, 31 August–2 September 2005 (pp. 71-76). Balmain: Mental Health Services Conference Inc. of Australia and New Zealand.

Helps YLM. & Pointer SC 2006. Child injury due to falls from playground equipment, Australia 2002–04. AIHW cat. no. INJCAT 91. Canberra: AIHW.

Hildyard K & Wolfe D 2002. Child neglect: developmental issues and outcomes. Child Abuse and Neglect 26:679–95.

Hill J, Waldfogel J, Brooks-Gunn J & Hun W-J 2005. Maternal employment and child development: a fresh look using newer methods. Developmental Psychology 41:833.

Hills A, King N & Armstrong T 2007. The contribution of physical activity and sedentary behaviours to the growth and development of children and adolescents: implications for overweight and obesity. Sports Medicine 37:533–45.

Hoff G, Cai J, Okah F & Dew P 2007. Changes in smoking behaviour between first and second pregnancies. American Journal of Health Behavior 31:583–90.

Hoffman C, Crnic K & Baker J 2006. Maternal depression and parenting: implications for children's emergent emotion regulation and behavioral functioning. Parenting: Science and Practice 6:271–95.

Hoi Shan S-C, Tan A, Chua Yee S, Hawkins R, Ka AL, But MS et al. 2008. Children's social and emotional well-being in Singapore. Research monograph no.7, June 2008. Singapore: Children's Society.

Horta B, Bahl R, Martines J & Victoria C 2007. Evidence on the long-term effects of breastfeeding: systematic reviews and meta-analyses. Geneva: World Health Organization.

Horwood L & Fergusson D 1998. Breastfeeding and later cognitive and academic outcomes. Pedriatrics 101:e9.

House of Representatives Standing Committee on Family and Human Services 2006. Balancing work and family. Canberra: Parliament of the Commonwealth of Australia.

House of Representatives Standing Committee on Health and Ageing 2007. The best start: report on the inquiry into the health benefits of breastfeeding. Canberra: Parliament of the Commonwealth of Australia.

Hovi P, Anderson S, Eriksson J & Jarvenpaa A 2007. Glucose regulation in young adults with very low birthweight. The New England Journal of Medicine 356:2053–63.

Howard A 2006. Injury in childhood: a vexingly simple problem. Canadian Medical Association Journal 175:899.

Huestis M & Choo R 2002. Drug abuse's smallest victims: in utero drug exposure. Forensic Science International 128:20–30.

Hull B & McIntyre P 2006. Timeliness of childhood immunisation in Australia. Vaccine 24:4403–8.

Hunt S 2009. Patterns of psychosocial functioning and mental health service utilization in children and adolescents with chronic health conditions or physical disabilities. All Graduate Theses and Dissertations. Paper 360. Utah: Utah State University.

Hyman I, Cohen I & Mahon M 2003. Student alienation syndrome: a paradigm for understanding the relation between school trauma and school violence. The California School Psychologist 8:73–86.

Ispa J, Fine M, Halgunseth L, Harper S, Robinson J, Boyce L et al. 2004. Maternal intrusiveness, maternal warmth, and mother–toddler relationship outcomes: variations across low-income ethnic and acculturation groups. Child Development 75:1613–31.

Izzo C, Weissberg R, Kasprow W & Fendrich M 1999. A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. American Journal of Community Psychology 27:817–39.

James-Burdumy S 2005. The effect of maternal labor force participation on child development. Journal of Labor Economics 23:177–211.

Jang J 2009. Taiwanese parents' perceptions of child care quality and decision-making and selection processes. Dissertation Abstracts International Section A. Humanities and Social Sciences 70(2–A):466.

Jauniaux E & Burton G 2007. Morphological and biological effects of maternal exposure to tobacco smoke on the feto-placental unit. Early Human Development 83:699–706.

Jennings G 2003. An exploration of meaningful participation and caring relationships as contexts for school engagement. The California School Psychologist 8:43.

Jimerson S 2003. Toward an understanding of definitions and measures of school engagement and related terms. The California School Psychologist 8:7.

Johnson J & Leff M 1999. Children of substance abusers: overview of research findings. Pediatrics 103:1085.

Johnston C 2006. Robust hope: finding a home for early childhood intervention in the new early year's landscape. Inaugural Pauline McGregor Memorial Address, 7th Biennial Early Childhood Intervention Australia National Conference Adelaide, South Australia, March 2006.

Julvez J, Ribas-Fito N, Torrent M, Forns M, Gracia-Esteban R & Sunyer J 2007. Maternal smoking habits and cognitive development of children at age 4 years in a population-based birth cohort. International Journal of Epidemiology 36:825–32.

Kalil A, Ryan R & Corey M 2009. Diverging destinies: maternal education and investments in children. Illinois: University of Chicago.

Kapoor N, Sankaran S, Hyer S & Shehata H 2007. Diabetes in pregnancy: a review of current evidence. Current Opinion in Obstetrics and Gynecology 19:586.

Katz I, La Placa V & Hunter S 2007. Barriers to inclusion and successful engagement of parents in mainstream services. In: Utting D (ed.). Parenting and the different ways it can affect children's lives: research evidence. York: Joseph Rowntree Foundation.

Kessler R, Amminger G, Aguilar-Gaxiola S, Alonso J, Lee S & Ustun TB 2007. Age of onset of mental disorders: a review of recent literature. Current Opinion in Psychiatry 20:359–64.

Kestila L, Kosken S, Martelin T, Rahkonen O, Pensola T, Pirkola S et al. 2006. Influence of parental education, childhood adversities, and current living conditions on daily smoking in early adulthood. European Journal of Public Health 16:617–26.

Key A, Ferguson M, Molfese D, Peach K, Lehman C & Molfese V 2007. Smoking during pregnancy affects speech-processing ability in newborn infants. Environmental Health Perspectives 115:623.

Kindermann T, McCollam T & Gibson E 1996. Peer networks and students' classroom engagement during childhood and adolescence. In: Juvonen J & Wentzel K (eds.). Social motivation: understanding children's school adjustment (pp. 279–312). Cambridge: Cambridge University Press.

Kirkorian H, Wartella E & Anderson D 2008. Media and young children's learning. The Future of Children 18:39–61.

Kohl G, Lengua L & McMahon R 2000a. Parent involvement in school conceptualizing multiple dimensions and their relations with family and demographic risk factors. Journal of School Psychology 38:501–23.

Kohl H, Fulton J & Caspersen C 2000b. Assessment of physical activity among children and adolescents: a review and synthesis. Preventive Medicine 31:54–76.

Kordt-Thomas C 2007. Nature and quality of care: two measures partially addressing impediments to adequate childcare for vulnerable children. Northampton, Massachusetts: Smith College School for Social Work.

Kowalenko N, Barnett B, Fowler C & Matthey S 2000. The perinatal period: early interventions for mental health, vol. 4. In: Kosky R, O'Hanlon A, Martin G & Davis C (eds). Clinical approaches to early intervention in child and adolescent mental health. Adelaide: Australian Early Intervention Network for Mental Health in Young People.

Kramer M, Aboud F, Mironova E, Vanilovich I, Platt R, Matush L et al. 2008. Breastfeeding and child cognitive development: new evidence from a large randomized trial. Archives of General Psychiatry 65:578.

Kroll B 2004. Living with an elephant: growing up with parental substance misuse. Child and Family Social Work 9:129.

Kruger E, Dyson K & Tennant M 2005. Pre-school child oral health in rural Western Australia. Australian Dental Journal 50:258–62.

Kyrklund-Blomberg N, Hu J & Gennser G 2006. Chronic effects of maternal smoking on pulse waves in the fetal aorta. Journal of Maternal Fetal & Neonatal Medicine 19:495–501.

Ladd G, Birch S & Buhs E 1999. Children's social and scholastic lives in kindergarten: related spheres of influence? Child Development 70:1373–400.

Lamb-Parker F, Piotrkowski C, Baker A, Kessler-Sklar S, Clark B & Peay L 2001. Understanding barriers to parent involvement in Head Start: a research-community partnership. Early Childhood Research Quarterly 16:35–51.

Lamont A 2010. The effects of child abuse and neglect for children and adolescents. Resource sheet. Melbourne: National Child Protection Clearinghouse, Australian Institute of Family Studies.

Lancaster S 1999. Being there: how parental mental illness can affect children. In: Cowling V (ed.) Children of parents with mental illness. Melbourne: Australian Council for Educational Research.

Landry S, Miller-Loncar C, Smith K & Swank P 2002. The role of early parenting in children's development of executive processes. Developmental Neuropsychology 21:15–41.

Laurel K & Wolraich ML 2007. ADHD service use and patterns in youth. Ambulatory Pediatrics 7:107–20.

Layton R 2003. Our best investment: a state plan to protect and advance the interests of children. Adelaide: Government of South Australia.

Lee V & Hoaken P 2007. Cognition, emotion, and neurobiological development: mediating the relation between maltreatment and aggression. Child Maltreatment 12:281–98.

Leventhal T & Newman S 2010. Housing and child development. Children and Youth Services Review 32:1165–1174.

Linares TJ, Singer LT, Kirchner HL, Short EJ, Min MO, Hussey P & Minnes S (2006). Mental health outcomes of cocaine-exposed children at 6 years of age. Journal of Pediatric Psychology 31:85–97.

Lippman L, Moore K & McIntosh H 2009. Positive indicators of child well-being: a conceptual framework, measures and methodological issues. Innocenti working paper no. 2009–21. Florence: UNICEF Innocenti Research Centre.

Lippman L & Rivers A 2008. Assessing school engagement: a guide for out-of-school time program practitioners. Publication #2008–39. Washington, DC: Child Trends.

Lippman L, Vandivere S, Keith J & Atienza A 2008. Child care use by low-income families: variations across states. Publication #2008–23. Washington, DC: Child Trends.

Lister S, McIntyre P, Burgess M & O'Brien E 1999. Immunisation coverage in Australian children: a systematic review 1990–1998. Communicable Diseases Intelligence 23:145–169.

Lodge J 2008. Working with families concerned with school-based bullying. Australian Family Relationships Clearinghouse briefing no. 11. Melbourne: Australian Institute of Family Studies.

Loeb S, Bridges M, Bassok D, Fuller B & Rumberger R 2007. How much is too much? The influence of preschool centers on children's social and cognitive development. Economics of Education Review 26:52.

Love J, Harrison L, Sagi-Schwartz A, van Ijzendoorn M, Ross C, Ungerer J et al. 2003. Child care quality matters: how conclusions may vary with context. Child Development 74:1021.

Low W, Tan S & Schwartz S 2000. The effect of severe caries on the quality of life in young children. Oral Health 90:13.

Ludwig D & Gortmaker S 2004. Programming obesity in childhood. The Lancet 364:226–7.

Lugo-Gil J & Tamis-Lemonda C 2008. Family resources and parenting quality: links to children's cognitive development across the first 3 years. Child Development 79:1065–85.

Luo Z, Wilkins R & Kramer M 2006. Effect of neighbourhood income and maternal education on birth outcomes: a population-based study. Canadian Medical Association Journal 174:1415.

Luthar S & Latendresse S 2005. Children of the affluent. Current Directions in Psychological Science 14:49.

MacIntyre C 2001. Hepatitis B vaccine: risks and benefits of universal neonatal vaccination. Journal of Paediatrics and Child Health 37:215–7.

Macmillan R & Hagan J 2004. Violence in the transition to adulthood: the socioeconomic consequences of adolescent victimization. Journal of Research on Adolescence 14:127–58.

Magnuson K 2007. Maternal education and children's academic achievement during middle childhood. Developmental Psychology 43:1497–512.

Malamitsi-Puchner A & Boutsikou T 2006. Adolescent pregnancy and perinatal outcome. Pediatric Endocrinology Reviews 3:170–1.

Mamun A, Lawlor D, Alati R, O'Callaghan M, Williams G & Najman J 2006. Does maternal smoking during pregnancy have a direct effect on future offspring obesity? Evidence from a Prospective Birth Cohort Study. American Journal of Epidemiology 164:317.

Mandell D, Walrath C, Manteuffel B, Sgro G & Pinto-Martin J 2005. The prevalence and correlates of abuse among children with autism served in comprehensive community-based mental health settings. Child Abuse and Neglect 29:1359–72.

Mantzicopoulos P 2003. Academic and school adjustment outcomes following placement in a developmental first-grade program. The Journal of Educational Research 97:90–105.

Marks H 2000. Student engagement in instructional activity: patterns in the elementary, middle, and high school years. American Educational Research Journal 37:153.

Marsh P 2000. Truancy or absenteeism? A school governance perspective. Queensland Journal of Educational Research 16:147–57.

Mathieu-Nolf M 2002. Poisons in the air: a cause of chronic disease in children. Journal of Toxicology: Clinical Toxicology 40(4):483–91.

McAra L 2004. Truancy, school exclusion and substance misuse. Edinburgh: The Edinburgh Study of Youth Transitions and Crime.

McClellan C & Cohen L 2007. Family functioning in children with chronic illness compared with healthy controls: a critical review. The Journal of Pediatrics 150:221–3.

McClelland A 2000. Effects of unemployment on the family. Economic and Labour Relations Review 11:198–212.

McConnell D, Llewellyn G, Mayes R, Russo D & Honey A 2003. Developmental profiles of children born to mothers with intellectual disability. Journal of Intellectual and Developmental Disability 28:1–14.

MCEETYA (Ministerial Council on Education, Employment, Training and Youth Affairs) 2001. Effective learning issues for Indigenous children aged 0 to 8 years. Discussion paper June 2001. Melbourne: MCEETYA Taskforce on Indigenous Education.

McGrail M & Humphreys J 2009a. The index of rural access: an innovative integrated approach for measuring primary care access. BMC Health Services Research 9:124.

McGrail M & Humphreys J 2009b. A new index of access to primary care services in rural areas. Australian and New Zealand Journal of Public Health 33:418–23.

McGregor L, Metzger M, Sanders R & Santana V 2007. Pediatric cancers in the new millennium: dramatic progress, new challenges. Oncology 21:809–20.

McLachlan H, Forster D, Yelland J, Rayner J & Lumley J 2008. Is the organisation and structure of hospital postnatal care a barrier to quality care? Findings from a state-wide review in Victoria, Australia. Midwifery 24:358–70.

McMahon T, Winkel J & Rounsaville B 2008. Drug abuse and responsible fathering: a comparative study of men enrolled in methadone maintenance treatment. Addiction 103:269.

McWayne C, Campos R & Owsianik M 2008. A multidimensional, multilevel examination of mother and father involvement among culturally diverse Head Start families. Journal of School Psychology 46:551–73.

McWayne C, Hampton V, Fantuzzo J, Cohen H & Sekino Y 2004. A multivariate examination of parent involvement and the social and academic competencies of urban kindergarten children. Psychology in the Schools 41:363–77.

Mehan H, Villanueva I, Hubbard L & Lintz A 1996. Constructing school success: the consequences of untracking low-achieving students. Cambridge: Cambridge University Press.

Melhuish E, Sylva K, Sammons P, Siraj-Blatchford I & Taggart B 2001. The effective provision of pre-school education project. Technical paper 7: Social/behavioural and cognitive development at 3–4 years in relation to family background. London: Institute of Education.

Menezes E, Yakoob M, Soomro T, Haws R, Darmstadt G & Bhutta Z 2009. Reducing stillbirths: prevention and management of medical disorders and infections during pregnancy. BMC Pregnancy and Childbirth 9:S4.

Milner A, Rao H & Greenough A 2007. The effects of antenatal smoking on lung function and respiratory symptoms in infants and children. Early Human Development 83:707–11.

Molnar B, Buka S & Kessler R 2001. Child sexual abuse and subsequent psychopathology: results from the national comorbidity survey. American Journal of Public Health 135:17–36.

Moore T 2008. Towards an early years learning framework for Australia. Parkville: Centre for Community Child Health.

Moore T & Sargood S 2005. Starting with the end in mind: outcome statements for early childhood intervention services. Parkville: Early Childhood Intervention Australia (Victoria Chapter).

Morgans A, Archer F, Walker T & Thuma E 2005. Barriers to accessing ambulance services in rural Victoria for acute asthma: patients' and medical professionals' perspectives. Australian Journal of Rural Health 13:116–20.

Must A & Strauss R 1999. Risks and consequences of childhood and adolescent obesity. International Journal of Obesity 23:S2–S11.

National Institute for Health and Clinical Excellence 2009. Promoting young people's social and emotional wellbeing in secondary education. National Institute for Health and Clinical Excellence public health guidance 20. London: National Institute for Health and Clinical Excellence.

National Research Council & Institute of Medicine 2004. Engaging schools: fostering high school students' motivation to learn. Washington, DC: National Academy Press.

National Scientific Council on the Developing Child 2005. Excessive stress disrupts the architecture of the developing brain: Working Paper No. 3. Cambridge: National Scientific Council on the Developing Child, Center on the Developing Child at Harvard University.

NCAC (National Childcare Accreditation Council) 2007. National Childcare Accreditation Council. Surry Hills: NCAC. Viewed 20 October 2008, <www.ncac.gov.au>.

Nechyba T, McEwan P & Older-Aguilar D 1999. The impact of family and community resources on student outcomes: an assessment of the international literature with implications for New Zealand. Wellington: Ministry of Education. Viewed 6 July 2010, <www.minedu.govt.nz/index.cfm>.

Nelson H, Nygren P, Walker M & Panoscha R 2006. Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. Pediatrics 117:e298.

Ng S & Zelikoff J 2006. Smoking during pregnancy: Subsequent effects on offspring immune competence and disease vulnerability in later life. Reproductive Toxicology 23:428–37.

NHMRC (National Health and Medical Research Council) 2003. Dietary guidelines for children and adolescents in Australia incorporating the infant feeding guidelines for health workers. Canberra: NHMRC.

NHMRC 2008. The Australian Immunisation Handbook, 9th edition. Canberra: NHMRC.

NHMRC 2009. Australian guidelines to reduce health risks from drinking alcohol. Canberra: NHMRC.

NHPC (National Health Performance Committee) 2004. National report on health sector performance indicators 2003. AIHW cat. no. HWI 78. Canberra: AIHW.

NICHD (National Institute of Child Health and Human Development) Early Child Care Research Network 2005. Early child care and children's development in the primary grades: follow-up results from the NICHD Study of Early Child Care. American Educational Research Journal 42:537–70.

NSW DoCS (New South Wales Department of Community Services) 2006. Parental alcohol misuse and the impact on children. Sydney: NSW DoCS.

O'Dea J 2008. Gender, ethnicity, culture and social class influences on childhood obesity among Australian schoolchildren: implications for treatment, prevention and community education. Health and Social Care in the Community 16:282.

O'Grady K, Krause V & Andrews R 2009. Immunisation coverage in Australian Indigenous children: time to move the goal posts. Vaccine 27:307–12.

Oates J 2010. Supporting parenting. Milton Keynes: The Open University.

OBGYN & Reproduction Week 2008. Women's health: some moms quit cigarettes, marijuana, alcohol during pregnancy, but dads don't. OBGYN & Reproduction Week 31 March 2008:241.

OECD (Organisation for Economic Co-operation and Development) 2002. Reading for change: performance and engagement across countries. Paris: OECD.

Ogbu J 2003. Black American students in an affluent suburb: a study of academic disengagement. Mahwah: Lawrence Erlbaum Associates Inc.

Olson D & Gorall D 2003. Circumplex model of marital and family systems. In: Walsh F (ed.) Normal Family Processes (3rd ed). New York: Guilford, 514–47.

Ortega F, Ruiz J, Castillo M & Sjostrom M 2008. Physical fitness in childhood and adolescence: a powerful marker of health. International Journal of Obesity 32:1–11.

Panaretto K, Mitchell M, Anderson L, Larkins S, Manessis V, Buettner P et al. 2007. Sustainable antenatal care services in an urban Indigenous community: the Townsville experience. Medical Journal of Australia 187:18.

Parker F, Boak A, Griffin K, Ripple C & Peay L 1999. Parent-child relationship, home learning environment, and school readiness. School Psychology Review 28:413–25.

Parker R 2008. Supporting families where there are dual diagnosis issues. Family Relationships Quarterly Issue 9. Melbourne: Australian Institute of Family Studies.

Patel V, Flisher A, Hetrick S & McGorry P 2007. Mental health of young people: a global public-health challenge. Lancet 369:1302–13.

Patton N 2003. The effects of parental drug use—children in kinship care: a review of the literature. St Kilda: The Mirabel Foundation.

Patton N 2004. Parental drug use—the bigger picture: a review of the literature. St Kilda: The Mirabel Foundation.

Perez-Pastor E, Metcalf B, Hosking J, Jeffery A, Voss L & Wilkin T 2009. Assortative weight gain in mother–daughter and father–son pairs: an emerging source of childhood obesity. Longitudinal Study of Trios (EarlyBird 43). International Journal of Obesity 33:727–35.

Peters M, Seeds K, Goldstein A & Coleman N 2008. Parental involvement in children's education 2007. Research Report DCSF-RR034. London: British Market Research Bureau International Limited.

Petersen P 2003. The world oral health report 2003: continuous improvement of oral health in the 21st century—the approach of the WHO Global Oral Health Programme. Community Dentistry Oral Epidemiology 31 (suppl):3–23.

Petry C & Hales C 2000. Long-term effects on offspring of intrauterine exposure to deficits in nutrition. Human Reproduction Update 6:578.

Pettit G, Bates J & Dodge K 1997. Supportive parenting, ecological context, and children's adjustment: a seven-year longitudinal study. Child Development 68:908–23.

Phillips D 2006. Birth weight and adulthood disease and the controversies. Fetal and Maternal Medicine Review 173:205–27.

Pike-Paris A 2004. Indoor air quality: Part 1—what it is. Pediatric Nursing 30(5):430–3.

Pillow W 1997. Decentering silences/troubling irony: teen pregnancy's challenge to policy analysis. Feminist critical policy analysis: a perspective from primary and secondary schooling:134–52. Great Britain: C Marshall.

Pitcl J, Provance E & Kerslake C 2006. Social and emotional well-being: the foundation for school readiness. California: WestEd Center for Prevention and Early Intervention.

Pollitt E, Watkins WE & Husaini MA 1997. Three-month nutritional supplementation in Indonesian infants and toddlers benefits memory function 8 y later. The American Journal of Clinical Nutrition 66:1357–63.

Poulos L, Toelle B & Marks G 2005. The burden of asthma in children: an Australian perspective. Paediatric Respiratory Reviews 6:20–7.

Power T 2004. Stress and coping in childhood: the parents' role. Parenting: Science and Practice 4:271–317.

Powis B, Gossop M, Bury C, Payne K & Griffiths P 2000. Drug-using mothers: social, psychological and substance use problems of women opiate users with children. Drug and Alcohol Review 19:171–80.

Press F & Hayes A 2000. OECD thematic review of early childhood education and care policy. Australian background report. Sydney: Institute of Early Childhood and Commonwealth of Australia.

Princeton University & Brookings Institution 2008. Children and electronic media. The Future of Children 18(1) Spring 2008.

Prinz R, Sanders M, Shapiro C, Whitaker D & Lutzker J 2009. Population-based prevention of child maltreatment: the U.S. Triple P System Population Trial. Prevention Science:1–12.

Pufall PB & Unsworth RP (ed.) 2004. Rethinking childhood. New Brunswick, NJ: Rutgers University Press.

Raatikainen K, Heiskanen N, Verkasalo P & Heinonen S 2006. Good outcome of teenage pregnancies in high-quality maternity care. The European Journal of Public Health 16:157.

Redmond G 2008. Children's perspectives on economic adversity: a review of the literature. SPRC Discussion Paper No. 149. Sydney: SPRC.

Renfrew M, Dyson L, Wallace L, D'Souza L, McCormick F & Spiby H 2005. Breastfeeding for longer: what works? The Journal of the Royal Society for the Promotion of Health 125:62.

Reynolds A 2000. Success in early childhood interventions: the Chicago child–parent centers. Lincoln: University of Nebraska.

Richardus J, Graafmans W, Verloove-Vanhorick S & Mackenbach J 2003. Differences in perinatal mortality and suboptimal care between 10 European regions: results of an international audit. BJOG: An International Journal of Obstetrics and Gynaecology 110:97–105.

Rick S & Douglas D 2007. Neurobiological effects of childhood abuse. Journal of Psychosocial Nursing 45:47–54.

Rigby K 2009. What do we know about bullying in schools? Viewed 13 March 2009, <www.kenrigby.net/>.

Rigby K & Slee P 1999. The nature of school bullying Australia. In: Smith PK, Morita Y, Junger-Tas J, Olweus D, Catalano R & Slee P (eds). The nature of school bullying. London: Routledge, 324–39.

Roberts-Thomson K, Spencer A & Jamieson L 2008. Oral health of Aboriginal and Torres Strait Islander Australians. Medical Journal of Australia 188:592.

Rodriguez E, Cristofaro T & Markese S 2002. Bridging the gaps among developmental research, practice, and public policy. NHSA Dialog 5:390–406.

Romer G & Barkmann C 2002. Children of somatically ill parents: a methodological review. Germany: University of Hamburg.

Ronan K, Canoy D & Burke K 2009. Child maltreatment: prevalence, risk, solutions, obstacles. Australian Psychologist 44:195–213.

Rosenberg S, Zhang D & Robinson C 2008. Prevalence of developmental delays and participation in early intervention services for young children. Pediatrics 121:e1503–e9.

Roth-Isigkeit A, Thyen U, Stoven H, Schwarzenberger J & Schmucker P 2005. Pain among children and adolescents: restrictions in daily living and triggering factors. Pediatrics 115:e152.

Rowe-Murray H & Fisher J 2002. Baby friendly hospital practices: cesarean section is a persistent barrier to early initiation of breastfeeding. Birth 29:125.

Rubin D, Erickson C, Agustin M, Clearly S, Allen J & Cohen P 1996. Cognitive and academic functioning of homeless children compared with housed children. Pediatrics 97:289–95.

Runions K & Keating D 2005. Authoritarian parenting and community context in the early development of hostile processing and behaviour. Paper presented at the 9th Australian Institute of Family Studies Conference, Melbourne, 9–11 February 2005.

Runyan D, Hunter W, Socolar R, Amaya-Jackson L, English D, Landsverk J et al. 1998. Children who prosper in unfavorable environments: the relationship to social capital. Pediatrics 101:12.

Ryan A & Patrick H 2001. The classroom social environment and changes in adolescents' motivation and engagement during middle school. American Educational Research Journal 38:437.

SA DoHA 2005. Aboriginal health—everybody's business: social and emotional wellbeing: a South Australian strategy for Aboriginal and Torres Strait Islander people 2005–2010. Adelaide: South Australian Aboriginal Health Partnership.

Saigal S 2000. School difficulties at adolescence in a regional cohort of children who were extremely low birth weight. Pediatrics 105:325–31.

Sajaniemi N, Suhonen E & Kontu E 2010. Verbal and non-verbal development in special language impairment children after early intervention. Early Child Development and Care 180:519.

Salihu H & Wilson R 2007. Epidemiology of prenatal smoking and perinatal outcomes. Early Human Development 83:713–20.

Sanders M 2002. Parenting interventions and the prevention of serious mental health problems in children. Medical Journal of Australia 77:87–92.

Sanders M 2003. Triple P—Positive Parenting Program: a population approach to promoting competent parenting. Australian e-Journal for the Advancement of Mental Health 2.

Sanders M 2008. Triple P—Positive Parenting Program as a Public Health Approach to Strengthening Parenting. Journal of Family Psychology 22:506–17.

Sawyer M, Arney F, Baghurst P, Clark J, Graetz B, Kosky R et al. 2000. Child and adolescent component of the national survey of mental health and well-being: mental health of young people in Australia. Canberra: Department of Health and Aged Care.

Sawyer M, Miller-Lewis L, Guy S & Wake M 2006. Is there a relationship between overweight and obesity and mental health problems in 4–5 year-old Australian children? Ambulatory Pediatrics 6:306.

Schack-Nielsen L & Michaelsen K 2006. Breast feeding and future health. Current Opinion in Clinical Nutrition and Metabolic Care 9:289.

Schnitzer P 2006. Prevention of unintentional childhood injuries. American Family Physician 74:1864–9.

Seefeldt C, Denton K, Galper A & Younoszai T 1999. The relation between Head Start parents' participation in a transition demonstration, education, efficacy and their children's academic abilities. Early Childhood Research Quarterly 14:99–109.

Seginer R 2006. Parents' educational involvement: a developmental ecology perspective. Parenting: Science and Practice 6:1–48.

Sendzik T, Fong G, Travers M & Hyland A 2008. An experimental investigation of tobacco smoke pollution in cars. Toronto: Ontario Tobacco Research Unit.

Sénéchal M 2006. Testing the home literacy model: parent involvement in kindergarten is differentially related to grade 4 reading comprehension, fluency, spelling, and reading for pleasure. Scientific Studies of Reading 10:59–87.

Sénéchal M & LeFevre J 2002. Parental involvement in the development of children's reading skill: A five-year longitudinal study. Child Development 73:445–60.

Shears J & Robinson J 2005. Fathering attitudes and practices: influences on children's development. Child Care in Practice 11:63–79.

Sheldon S 2002. Parents' social networks and beliefs as predictors of parent involvement. The Elementary School Journal 102:301–16.

Sheldon S & Epstein J 2005. Involvement counts: family and community partnerships and mathematics achievement. The Journal of Educational Research 98:196.

Shepard L & Smith M 1989. Flunking grades: research and policies on retention. New York: Falmer Press.

Shonkoff J & Phillips D 2000. From neurons to neighbourhoods: the science of early childhood development. Washington, DC: National Academy Press.

Shore R 1997. Rethinking the brain: new insights into early development. New York: Families and Work Institute.

Shumow L, Vandell D & Kang K 1996. School choice, family characteristics, and home-school relations: contributors to school achievement? Journal of Educational Psychology 88:451–60.

Simon T, Anderson M, Thompson M, Crosby A & Sacks J 2002. Assault victimization and suicidal ideation or behaviour within a national sample of US adults. Suicide and Life-Threatening Behaviour 32:42–50.

Sinclair M, Christenson S, Lehr C & Anderson A 2003. Facilitating student engagement: lessons learned from check and connect longitudinal studies. The California School Psychologist 8:29.

Skinner E & Belmont M 1993. Motivation in the classroom: reciprocal effects of teacher behavior and student engagement across the school year. Journal of Educational Psychology 85:571–81.

Skinner E, Johnson S & Snyder T 2005. Six dimensions of parenting: a motivational model. Parenting: Science and Practice 5:175–235.

Sleebos J 2003. Low fertility rates in OECD countries: facts and policy responses. Paris: OECD.

Slowinski K 2001. Unplanned teenage pregnancy and the support needs of young mothers: Part B review of the literature. South Australia: Department of Human Services.

Sly P, Deverell M, Kusel M & Holt P 2007. Exposure to environmental tobacco smoke in cars increases the risk of persistent wheeze in adolescents. Letter to the editor. Medical Journal of Australia 186:322.

Smart D & Vassallo S 2008. Pathways to social and emotional wellbeing: lessons from a 24-year longitudinal study. Paper presented at Australian Council for Educational Research Conference 2008: Touching the Future: Building Skills for Life and Work. Brisbane Convention and Exhibition Centre, 10–12 August 2008.

Sosinsky L, Lord H & Zigler E 2007. For-profit/nonprofit differences in center-based child care quality: results from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development. Journal of Applied Developmental Psychology 28:390–410.

Spector N & Kelly S 2006. Pediatrician's role in screening and treatment: bullying, prediabetes, oral health. Current Opinion in Pediatrics 18.

Springer A, Parcel G, Baumler E & Ross M 2006. Supportive social relationships and adolescent health risk behaviour among secondary school students in El Salvador. Social Science and Medicine 62:1628–40.

Steck B, Amsler F, Schwald Dillier A, Grether A, Kappos L & Burgin D 2005. Indication for pyschotherapy in offspring of a parent affected by a chronic somatic disease (for example, multiple sclerosis). Pyschopathology 38(1):38–48.

Stipek D 2002. Good instruction is motivating. In: Wigfield A & Eccles J (eds.). Development of achievement motivation. San Diego: Academic Press, 309–32.

Stone W & Hughes J 2000. What role for social capital in family policy? Family Matters 56, Winter:20–7.

Story M, Kaphingst K, Robinson-O'Brien R & Glanz K 2008. Creating healthy food and eating environments: policy and environmental approaches. Annual Review of Public Health 29:253–272.

Subrahmanyam K & Greenfield P 2008. Online communication and adolescent relationships. Future of Children 18:119.

Sylva K, Melhuish E, Sammons P, Siraj-Blatchford I, Taggart B & Elliot K 2003. The Effective Provision of Pre-school Education (EPPE) project: findings from the pre-school period. London: Institute of Education, University of London.

Szatmari P, Offord D & Boyle M 2006. Correlates, associated impairments and patterns of service utilization of children with attention deficit disorder: findings from the Ontario Child Health Study. Journal of Child Psychology and Psychiatry 30:205–17.

Talen M, Stephens L, Marik P & Buchholz M 2007. Well-child check-up revised: an efficient protocol for assessing children's social–emotional development. Families, Systems, and Health 25:23.

Tamis-LeMonda C, Shannon J, Cabrera N & Lamb M 2004. Fathers and mothers at play with their 2-and 3-year-olds: contributions to language and cognitive development. Child Development 75:1806–20.

Tappy L 2006. Adiposity in children born small for gestational age. Internal Journal of Obesity 30:S36–S40.

Tennant S, Hetzel D & Glover J 2003. A social health atlas of young South Australians. Adelaide: Public Health Information Development Unit.

Towner E 2005. Injury and inequalities: bridging the gap. International Journal of Injury Control and Safety Promotion 12:79.

Tran M, Phung H, Young L, Hopper U & Hillman K 2002. Patterns and characteristics of ethnic Australian women utilising ethno-specific maternal and child health services. Australian Health Review: a publication of the Australian Hospital Association 25:107.

Triche E & Hossain N 2007. Environmental factors implicated in the causation of adverse pregnancy outcome. Seminars in Perinatology 31:240–2.

Turner K & Sanders M 2005. Dissemination of evidence-based parenting and family support strategies: learning from the Triple P—Positive Parenting Program system approach. Aggression and Violent Behavior 11:176–93.

UNICEF Innocenti Research Centre 2009. Innocenti social monitor 2009. Child well-being at a crossroads: evolving challenges in Central and Eastern Europe and the Commonwealth of Independent States. Florence: UNICEF Innocenti Research Centre.

Valeski T & Stipek D 2001. Young children's feelings about school. Child Development 72:1198–213.

van der Lee J, Mokkink L, Grootenhuis M, Heymans H & Offringa M 2007. Definitions and measurement of chronic health conditions in childhood: a systematic review. Journal of the American Medical Association 297:2741.

Vetiska J, Glaab L, Perlman K & Daneman D 2000. School attendance of children with Type 1 diabetes. Diabetes Care 23:1706.

Vic DHS 2002. An integrated strategy for child protection and placement services. Melbourne: Vic DHS.

Vic DHS 2006. The state of Victoria's children report 2006. Melbourne: Vic DHS. Viewed 20 June 2008, <www.eduweb.vic.gov.au/edulibrary/public/govrel/Policy/children/sovcreport06.pdf>.

Vic DHS 2008. Headline indicators for children's health, development and wellbeing. June 2006. Prepared by the Victorian Government Department of Human Services on behalf of the Australian Health Ministers' conference and the Community and Disability Services Ministers' conference. Melbourne: Vic DHS.

Victorian Department of Education and Early Childhood Development 2009. The state of Victoria's children 2008: A report on how children and young people in Victoria are faring. Melbourne: Victorian Department of Education and Early Childhood Development.

Vinson T, Rawsthorne M & Cooper BA 2007. Dropping off the edge: the distribution of disadvantage in Australia. Richmond, Vic & Curtin, ACT: Jesuit Social Services & Catholic Social Services Australia.

von Kries R, Toschke A, Koletzko B & Slikker W 2002. Maternal smoking during pregnancy and childhood obesity. American Journal of Epidemiology 156:954–61.

Waldfogel J, Han W & Brooks-Gunn J 2002. The effects of early maternal employment on child cognitive development. Demography 39:369–92.

Walsh C, MacMillan H & Jamieson E 2003. The relationship between parental substance abuse and child maltreatment: findings from the Ontario Health Supplement. Child Abuse and Neglect 27:1409–25.

Waters E, Goldfeld S & Hopkins S 2002. Indicators for child health, development and wellbeing. a systematic review of the literature and recommendations for population

monitoring. Melbourne: Centre for Community Child Health, Royal Children's Hospital & Department of Paediatrics, University of Melbourne.

Watt R 2005. Strategies and approaches in oral disease prevention and health promotion. Bulletin of the World Health Organization 83:711–8.

Weare K & Gray G 2003. What works in developing children's social and emotional competence and wellbeing? Research report RR456. London: Department for Education and Skills.

Weiss H, Caspe M & Lopez M 2008. Family involvement promotes success for young children. In: Cornish M (ed.). Promising practices for partnering with families in the early years. United States: Information Age Publishing, 1–20.

Weitzman C, Roy L, Walls T & Tomlin R 2004. More evidence for reach out and read: a home-based study. Pediatrics 113:1248–53.

Whitlock E, Williams S, Gold R, Smith P & Shipman S 2005. Screening and interventions for childhood overweight: a summary of evidence for the US Preventive Services Task Force. Pediatrics 116:e125–44.

WHO (World Health Organization) 2001. Mental health: strengthening mental health promotion. Geneva: WHO. Viewed 6 July 2010, <www.who.int/mediacentre/factsheets/fs220/en/>.

WHO 2002. Infant and young child nutrition: global strategy on infant and young child feeding. Geneva: WHO. Viewed 6 July 2010, <www.who.int/gb/ebwha/pdf_files/WHA55/ea5515.pdf>.

WHO 2005. Annex: Global Immunization Vision and Strategy 2006–2015. Geneva: WHO.

WHO 2006. Child and adolescent injury prevention: a WHO plan of action 2006–2015. Geneva: WHO.

WHO 2007a. Immunization summary: the 2007 edition. Geneva: WHO.

WHO 2007b. Protection from exposure to second-hand tobacco smoke: policy recommendations. Geneva: WHO.

WHO 2007c. Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6–8 November 2007 in Washington D.C., USA. Geneva: WHO.

Wise S 2003. Family structure, child outcome and environmental mediators: an overview of the development in diverse families study. Research paper no. 30. Melbourne: Australian Institute of Family Studies.

Wong S & Hughes J 2006. Ethnicity and language contributions to dimensions of parent involvement. School Psychology Review 35:645.

Yassi A, Kjellstrom T, de Kok T & Guidotti T 2001. Basic environmental health. Oxford: Oxford University Press.

Yoshikawa H 1995. Long-term effects of early childhood programs on social outcomes and delinquency. The Future of Children 5:51–75.

Yu P 2008. Mortality of children and parental disadvantage. Paper presented at Australian Social Policy Research Conference Sydney, 11–13 July 2007. Social Policy Research Centre, University of New South Wales.

Zellman G & Perlman M 2006. Parent involvement in child care settings: conceptual and measurement issues. Early Child Development and Care 176:521.

Ziegler D, Pozza L, Waters K & Marshall G 2005. Advances in childhood leukaemia: successful clinical-trials research leads to individualised therapy. Medical Journal of Australia 182:78–81.

Zimmerman F & Bell J 2010. Associations of television content type and obesity in children. American Journal of Public Health 100:334.

Zolotor A, Kotch J, Dufort V, Winsor J, Catellier D & Bou-Saada I 1999. School performance in a longitudinal cohort of children at risk of maltreatment. Maternal and Child Health Journal 3:19–27.

Zubrick S, Dudgeon P, Gee G, Glaskin B, Kelly K, Paradies Y, Scrine C and Walker R 2010. Social Determinants of Aboriginal and Torres Strait Islander Social and Emotional Wellbeing. In: Purdie N, Dudgeon P & Walker R (ed.). Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice. Canberra: Commonwealth of Australia.

Zubrick S, Silburn S, DeMaio J, Shepherd C, Griffin J & Dalby Rea 2006. The Western Australian Aboriginal Child Health Survey: improving the educational experiences of Aboriginal children and young people. Perth: Curtin University of Technology & Telethon Institute for Child Health Research.

Zubrick S, Silburn S, Lawrence D, Mitrou F, Dalby R, Blair E et al. 2005. The Western Australian Aboriginal Child Health Survey: the social and emotional wellbeing of Aboriginal children and young people. Perth: Curtin University of Technology & Telethon Institute for Child Health Research.

Zubrick S, Smith GJ, Nicholson J, Sanson A & Jackiewicz T 2008. Parenting and families in Australia (Social policy research paper 34). Canberra: Australian Government Department of Families, Housing, Community Services and Indigenous Affairs.

Zubrick S, Williams A, Silburn S & Vimpani G 2000. Indicators of social and family functioning. Canberra: Australian Government Department of Family and Community Services.

Zwi K & Henry R 2005. Children in Australian society. Medical Journal of Australia 183:154–62.

List of tables

List of figures